ORDER NO. SD81041862C8

Service Manual

Direct Drive Automatic Turntable System

SL-DL1

[E], [EK], [XL], [EB], [EF],
[EG], [EI], [EH], [XA], [XM]

SL-DL1(K)

[E], [XL], [EG],
[EH], [XA], [XM]

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

*** The colors of this model include silver and black.**
*** The black type model is provided with (K) in the Service Manual.**

English

Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

■ General

Power supply:	~110-120/220-240V, 50/60 Hz
Power consumption:	17 W
Dimensions: (W x H x D)	43 x 8.8 x 35 cm 43 x 39.7 x 35 cm (Maximum height when top (dust cover) is open.)
Weight:	7.1 kg (15.6 lb.)

■ Turntable section

Type:	Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Manual speed selection possible. Auto size select 2-speed search functions Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive method:	F.G. servo control
Turntable platter:	Aluminum die-cast Diameter 31.2 cm
Turntable speeds:	33-1/3 rpm and 45 rpm Auto speed select (Manual selection possible)
Pitch control:	10% adjustment range
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ± 0.035% peak (IEC 98A Weighted)

* Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	−56 dB (IEC 98A Unweighted) −78 db (IEC 98A Weighted)

■ Tonearm section

Type:	Dynamic balanced type Linear tracking tonearm 4-pivot gimbal suspension
Effective length:	10.5 cm (4-1/8″)
Tracking error angle:	Within ± 0.1°
Effective mass:	9 g (including cartridge)
Resonance frequency:	12 Hz
Tonearm drive motor:	DC motor

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Cartridge section

Type:	Moving magnet stereo cartridge One point suspension system
Magnet:	Samarium cobalt (Sm-Co)
Magnetic circuit:	All laminated core
Frequency response:	10 Hz to 35 kHz 20 Hz to 10 kHz ± 1 dB
Output voltage:	2.5 mV at 1 kHz, 5cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	More than 22 dB at 1 kHz
Channel balance:	Within 1.8 dB at 1 kHz
Recommended load impedance:	47 kΩ ~100 kΩ
Compliance (dynamic):	12 x 10^{-6} cm/dyne at 100 Hz
Stylus pressure range:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-23CS (Equivalent replacement stylus: EPS-23ES)

Deutsch

TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind circa Werte.

Allgemeine Daten

Stromversorgung:	~110-120/220-240V, 50/60 Hz Wechselstrom
Leistungsaufnahme:	17 W
Abmessungen: (B x H x T)	43 x 8,8 x 35 cm 43 x 39,7 x 35 cm (Maximale Höhe bei vollständig geöffnetem Gehäuseoberteil.)
Gewicht:	7,1 kg

Plattenspieler

Typ:	Automatischer Plattenspieler Auto-Start/Auto—Zuführung Rückführautomatik Stopp-Automatik Wiederhol-Betrieb Automatische Drehzahlwahl Manuelle Drehzahlwahl möglich 2-Geschwindigkeiten-Suchfunktionen Plattenpräsenz-Registrierung
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Antriebsregel-Methode:	FG-Servo-Steuerung
Plattenteller:	Aluminium-Druckguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min Automatische Drehzahlwahl (manuelle Wahl möglich)
Drehzahl-Feinregulierung:	10% Einstellbereich
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ± 0,035% Spitze (IEC 98A bewertet)
Rumpel-Fremdspannungsabstand:	–56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	–78 dB (IEC 98A bewertet)

* Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Tonarm

Typ:	Dynamisch ausbalancierter Tangential-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager
Effektive Länge:	105 mm
Spurfehlwinkel:	Innerhalb ± 0,1°
Effektive Masse:	9 g (einschließlich Tonabnehmer)
Resonanzfrequenz:	12 Hz
Tonarm-Antriebsmotor:	Gleichstrommotor

Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem
Magnet:	Samarium-Kobalt (SM-Co)
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 35 kHz 20 Hz bis 10 kHz ± 1 dB
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral (7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° [DIN 45 500])
Kanaltrennung:	Mehr als 22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 1,8 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ ~100 kΩ
Nachgiebigkeit (dynamisch):	12 x 10^{-6} cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25 ± 0,25 g (12,5 ± 2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-23CS (Gleichwertige Ersatznadel: EPS-23ES)

Français

CARACTERSTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation:	Alternatif 110-120/220-240V, 50/60 Hz
Consommation:	17 W
Dimensions: (L x H x P)	43 x 8,8 x 35 cm 43 x 39,7 x 35 cm (Hauteur maximum lorsque le dessus (couvercle protègepoussière) est ouvert.)
Poids:	7,1 kg

■ Platine de lecture

Type:	Platine automatique Départ automatique/Entrée automatique Retour automatique Arrêt automatique Audition répétée Sélection de vitesse automatique Sélection de vitesses manuelle possible Sélection automatique du diamètre Fonctions exploratrices à 2 vitesses Détection de la présence d'un disque
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Groupe de réglage:	Servocommande du générateur de fréquence
Plateau de lecture:	Aluminium moulé sous pression Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m Sélecteur de vitesse automatique (Sélection manuelle possible)
Réglage d'écart:	Plage de réglage de 10%
Pleurage et scintillement:	0,012% de valeur efficace* 0.025% de valeur efficace (JIS C5521) ± 0,035% de crête (IEC 98A Pondéré)

* Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement:	–56 dB (IEC 98A Non pondéré) –78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type:	Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
Longueur effective:	105 mm
Angle d'erreur de piste:	En deçà de ± 0.1°
Masse réele:	9 g (y compris la cellule pick-up)
Fréquence de résonance:	12 Hz
Moteur d'entraînement du bras de lecture:	Moteur C.C. sans noyau

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile Système de suspension ponctuelle
Aimant:	Samarium-Cobalt (Sm-Co)
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 35 kHz 20 Hz à 10 kHz ± 1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux:	Plus de 22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 1,8 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ ~ 100kΩ
Elasticité (dynamique):	12 x 10^{-6} cm/dyne à 100 Hz
Plage de la force verticalle:	1,25 ± 0.25 g (12,5 ± 2,5 mN)
Poids:	6 g (cellule seule)
Remplacement de la pointe de lecture:	EPS-23CS (Pointe de lecture de remplacement équivalente: EPS-23ES)

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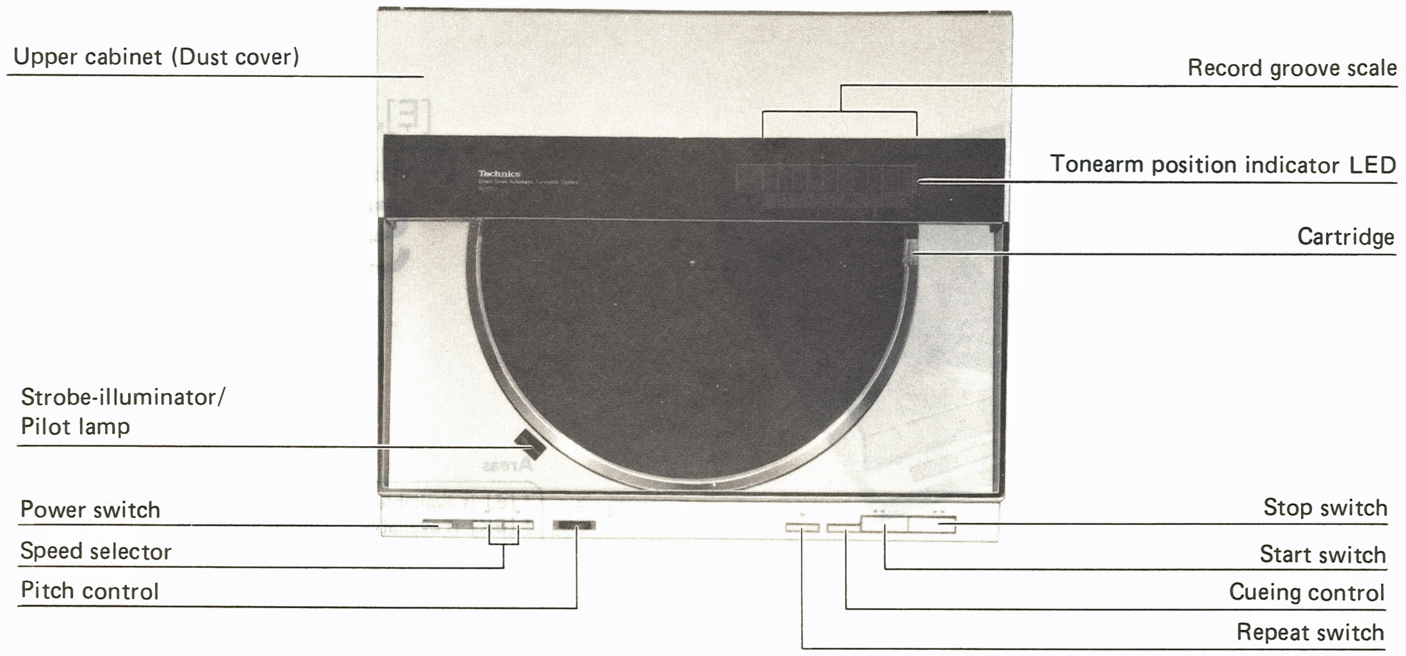
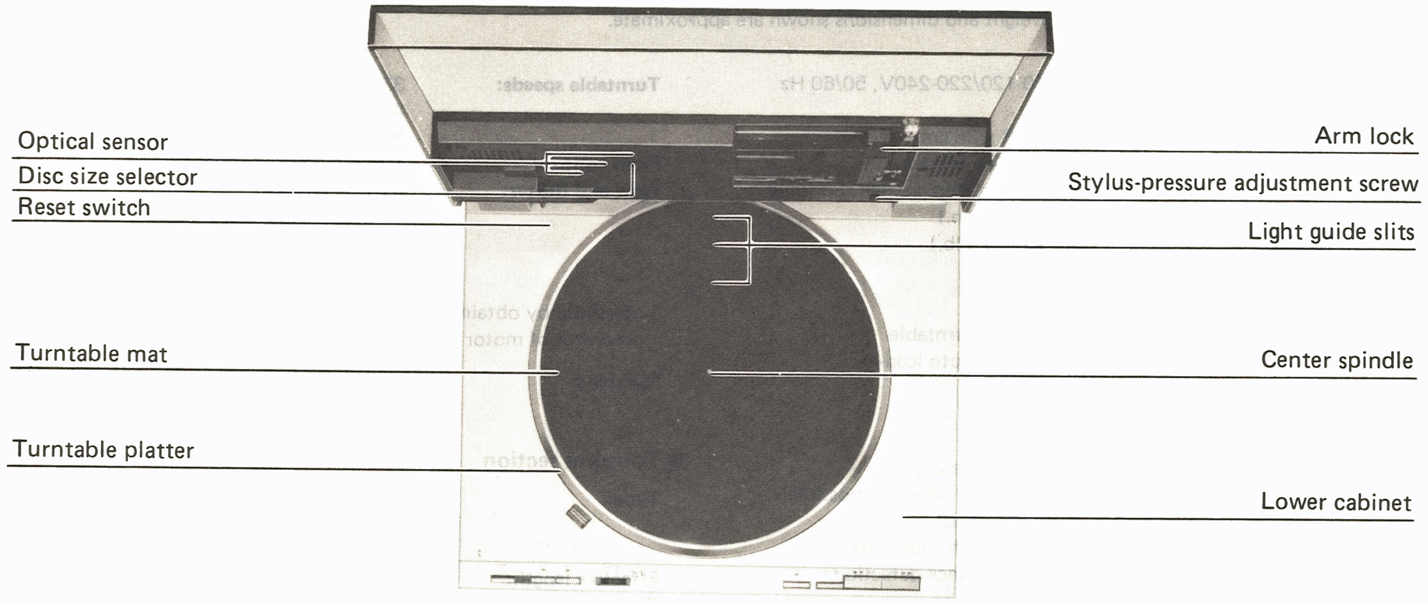
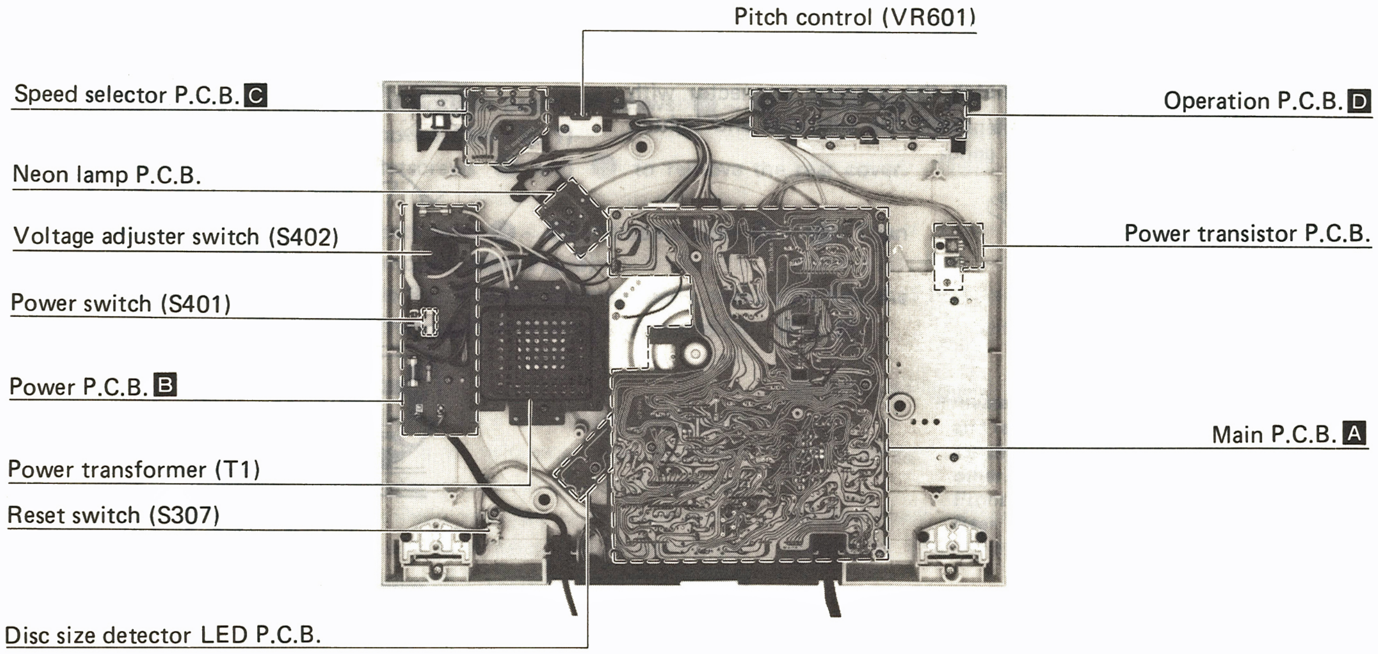
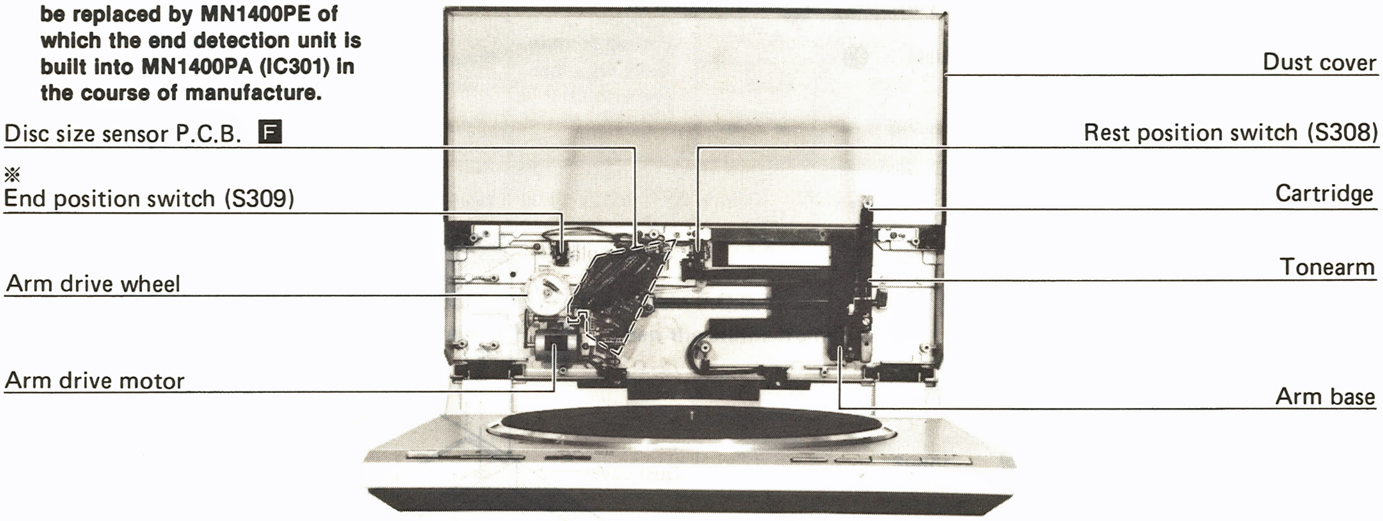
■ LOCATION OF CONTROLS


Upper cabinet (Dust cover)
Record groove scale
Tonearm position indicator LED
Cartridge
Strobe-illuminator/ Pilot lamp
Power switch
Speed selector
Pitch control
Stop switch
Start switch
Cueing control
Repeat switch


Optical sensor
Disc size selector
Reset switch
Turntable mat
Turntable platter
Arm lock
Stylus-pressure adjustment screw
Light guide slits
Center spindle
Lower cabinet


Pitch control (VR601)
Speed selector P.C.B. C
Operation P.C.B. D
Neon lamp P.C.B.
Voltage adjuster switch (S402)
Power transistor P.C.B.
Power switch (S401)
Power P.C.B. B
Main P.C.B. A
Power transformer (T1)
Reset switch (S307)
Disc size detector LED P.C.B.

※ S309 (end detection switch) will be replaced by MN1400PE of which the end detection unit is built into MN1400PA (IC301) in the course of manufacture.


Dust cover
Disc size sensor P.C.B. F
Rest position switch (S308)
※
End position switch (S309)
Cartridge
Arm drive wheel
Tonearm
Arm drive motor
Arm base

■ FEATURES

Dynamic balanced linear tracking tonearm employs optical sensor and groove deflection angle detection for extremely stable and accurate tracking.

The linear tracking tonearm moves across the record surface in the same way as the cutter head used to make the record in the first place. Therefore there is virtually no tracking error or skating force.

Located by the stylus is an optical sensor that detects tracking conditions by means of groove deflection angle. Based on this information, tonearm movement is controlled to maintain optimum tracking at all times.

A precision DC motor is used for tonearm drive to assure quiet and accurate control.

A precision DC motor and low-friction slide bearing assure accurate tonearm movement.

A 4-point pivot bearing gimbal suspension developed by Technics reduces friction and raises sensitivity while contributing to smooth tracing ability.

Simple base operation. Completely automatic play.

Turn on the power, put on a record, close the top and press the start switch. After that, everything is handled by the microcomputer and optical sensor which automatically detect record size, select correct speed and cue the tonearm to the lead-in groove.

For non-standard records, front panel speed selectors let you select the correct speed manually (large 45s, or small 33-1/3 records, for example).

The tonearm automatically returns to the start position after completing play. The tonearm does not move if no record is on the platter.

Complex operation also possible.

Although easy operation is a basic feature of this unit, complex functions are also possible. The **"search"** function allows start, stop switches controlled inward and outward movement of the tonearm at slow and fast speed, plus fine control in approximately 1 mm steps.

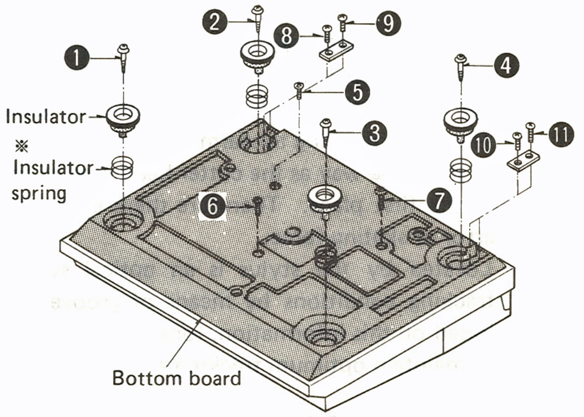
■ QUICK REFERENCE CHART FOR START AND STOP OPERATION

Switch pressed Cueing up/down	**Start Switch**				**Stop Switch**			
	Pressed momentarily (less than one second)	Pressed intermittently	Pressed continuously		Pressed momentarily (less than one second)	Pressed intermittently	Pressed continuously	
			Lightly ◁ ◀	Hard ◀ ◀			Lightly ▶ ▷	Hard ▶ ▶
Cueing up (▼)	—	Tonearm moves inward in small steps.	Tonearm moves inward.	Moves faster.	—	Tonearm moves outward in small steps.	Tonearm moves outward.	Moves faster.
Cueing down (▼)	Tonearm rises and returns to start position and begins play again.	—	Tonearm rises and moves inward.	Tonearm rises and moves faster.	Auto-return (reject)	—	Tonearm rises and moves outward.	Tonearm rises and moves faster.

■ DISASSEMBLY INSTRUCTIONS

• How to remove the bottom board and main P.C.B.

1. Remove the turntable and turntable seat.
2. Turn the main body upside down, using a solft sheet of cloth or the like as a cushion to protect the upper cabinet and dust cover.
3. Remove the insulator and bottom board setscrews ①～⑪. Then the bottom board can be removed. **(See Fig. 1)**
4. Remove the rear cover setscrews ⑫ and ⑬ to remove the rear cover. **(Fig. 2)**
5. Remove the main P.C.B. setscrews ⑭～㉑ and connectors ㉒～㉗. Then the main P.C.B. can be removed. **(See Fig. 3)**
   *When installing the main P.C.B. onto the main body, make sure that the connector ㉘ (CN102) is engaged with the stator frame pin. **(Fig. 3)**



※Please note that the front and rear insulator springs are different from each other.
Front. . . . . .White
Rear . . . . . .Yellow

Fig. 1

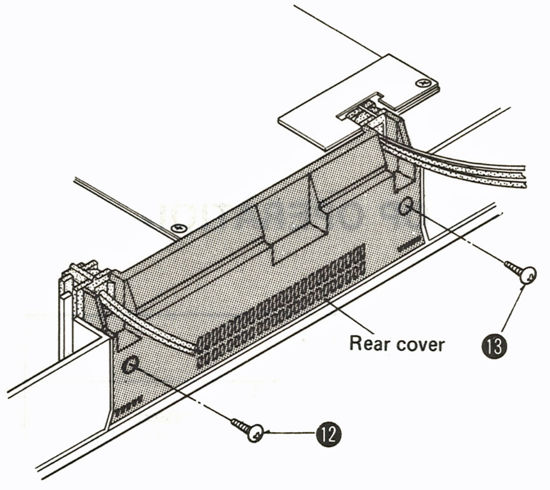


Fig. 2

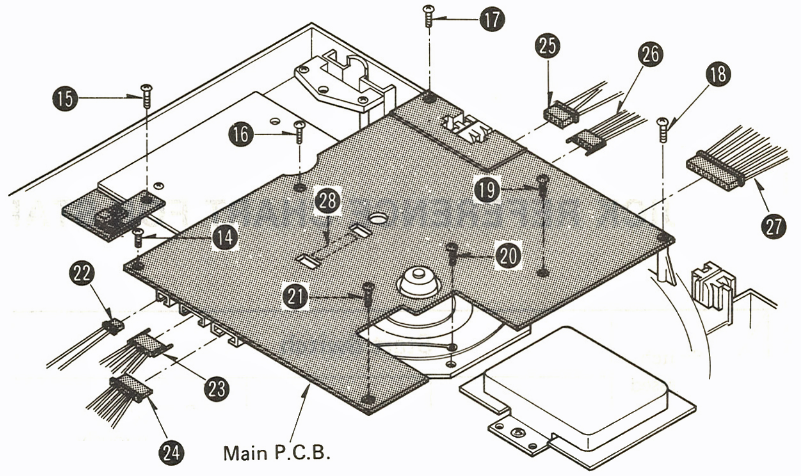


Fig. 3

• How to remove the stator frame

1. Remove the main P.C.B.
   (Refer to "How to remove the bottom board and main P.C.B.")
2. Remove the stator frame setscrews ㉙～㉜. Then the stator frame can be removed. **(Fig. 4)**

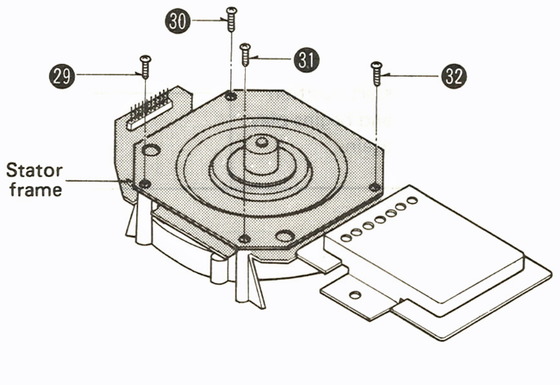


Fig. 4

• How to remove the cartridge

1. Open the upper cabinet and turn the arm lock in the direction of the arrow to lock the tonearm.
2. Loosen the cartridge setscrew with the screwdriver. (Turn the setscrew until it is freed as shown in **Fig. 5.)**
3. Pull out the cartridge, taking care not to touch the stylus. **(Fig. 6)**
4. When mounting the cartridge, match the tonearm connector with the cartridge pin and completely insert the cartridge and tighten the setscrew. **(Fig. 6)**

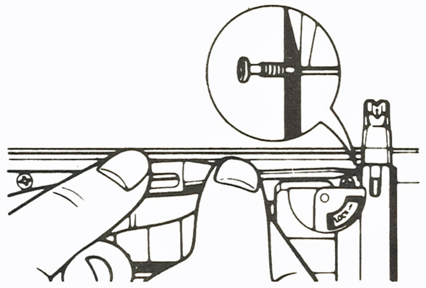


Fig. 5

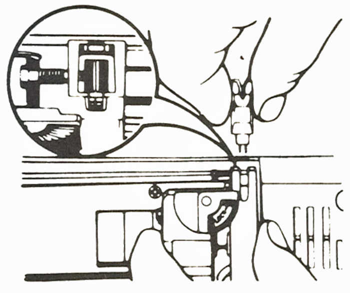


Fig. 6

• How to remove the surface plate and dust cover

1. Remove the cartridge. **(Refer to "How to remove the cartridge".)**
2. Open the upper cabinet and push the scale part of the surface plate from inside. **(Fig. 7)**
   *Carefully remove the surface plate since it is secured with double-sided tape.
3. Remove the dust cover setscrews ㉝～㉟. **(Fig. 8)**
4. Completely open the dust cover; remove the upper cabinet cover setscrews ㊱～㊹; and remove the upper cabinet cover while pulling the tonearm in the direction of the arrow. **(Fig. 9)**
5. Remove the dust cover setscrews ㊺ and ㊻.
   Then the dust cover can be removed by pulling it in the direction of the arrow. **(Fig. 10)**

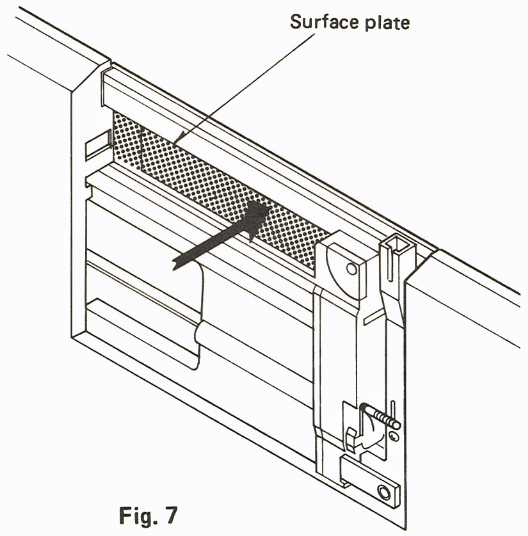


Fig. 7

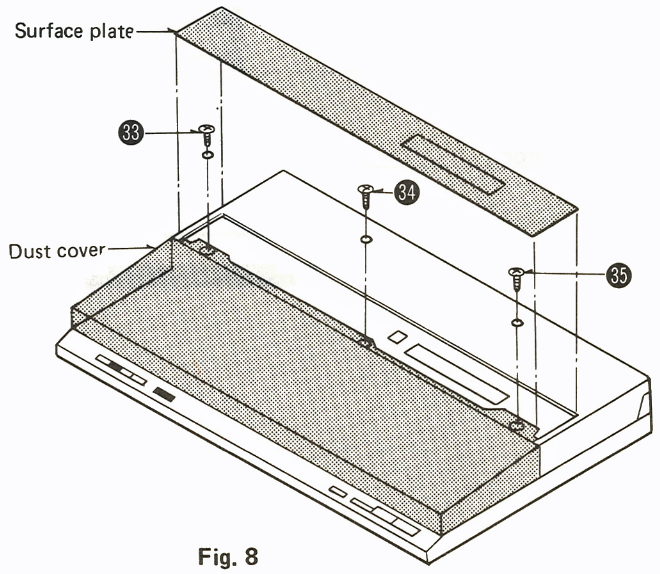


Fig. 8

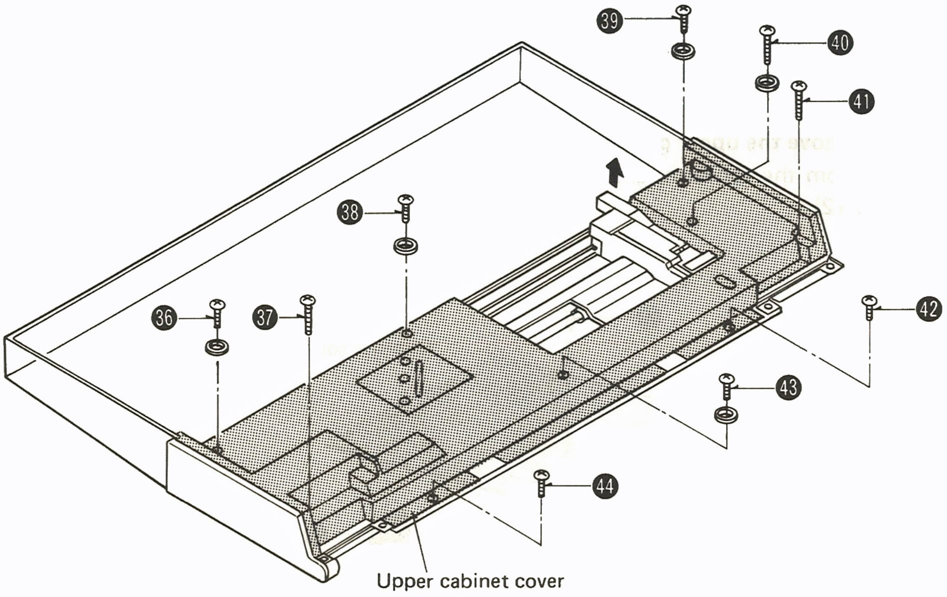

㊴
㊵
㊶
㊳
㊱
㊲
㊷
㊸
㊹
Upper cabinet cover

Fig. 9

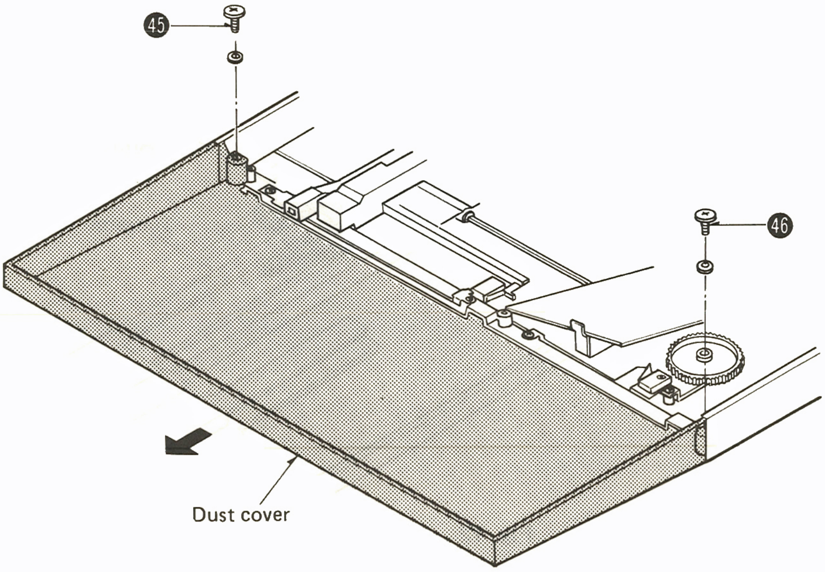

㊺
㊻
Dust cover

Fig. 10

- **How to remove the upper cabinet**

1. Remove the rear cover. **(Refer to "How to remove the bottom board and main P.C.B.")**
2. Remove the connectors ㊼ ~ ㊾. **(Fig. 11)**
3. Remove the hinge setscrews ㊿ ~ (53) ; open the upper cabinet and remove it by lifting. **(Fig. 11)**

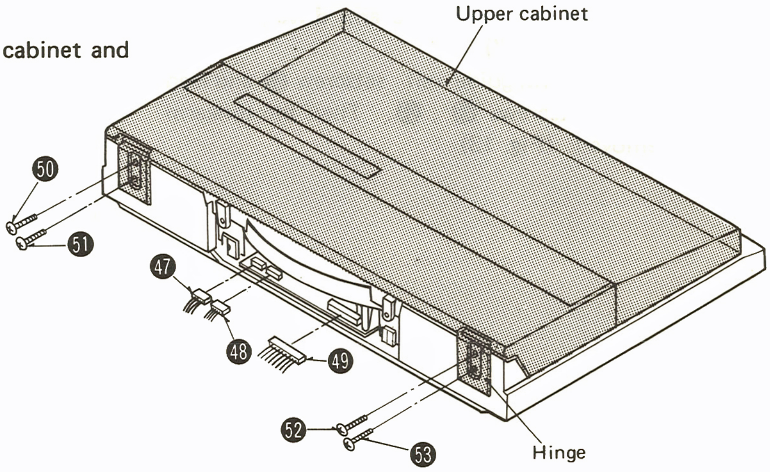

Upper cabinet
㊿
(51)
㊼
㊽
㊾
(52)
(53)
Hinge

Fig. 11

• How to remove the arm drive plate and disc size sensor P.C.B.

1. Remove the upper cabinet cover. **(Refer to "How to remove the surface plate and dust cover.")**
2. Remove the disc size sensor P.C.B. setscrew (54) and connectors (55) , (56) . **(Fig. 12)**
3. To remove the disc size sensor P.C.B. completely, remove the upper cabinet and the lead wire clamper setscrews (57) in **Fig. 12. (Refer to "How to remove the upper cabinet.")**
4. Remove the arm drive rope from the tonearm, and remove the arm drive plate setscrews (58) ~ (61) . Then the arm drive board can be detached. **(Fig. 12)**

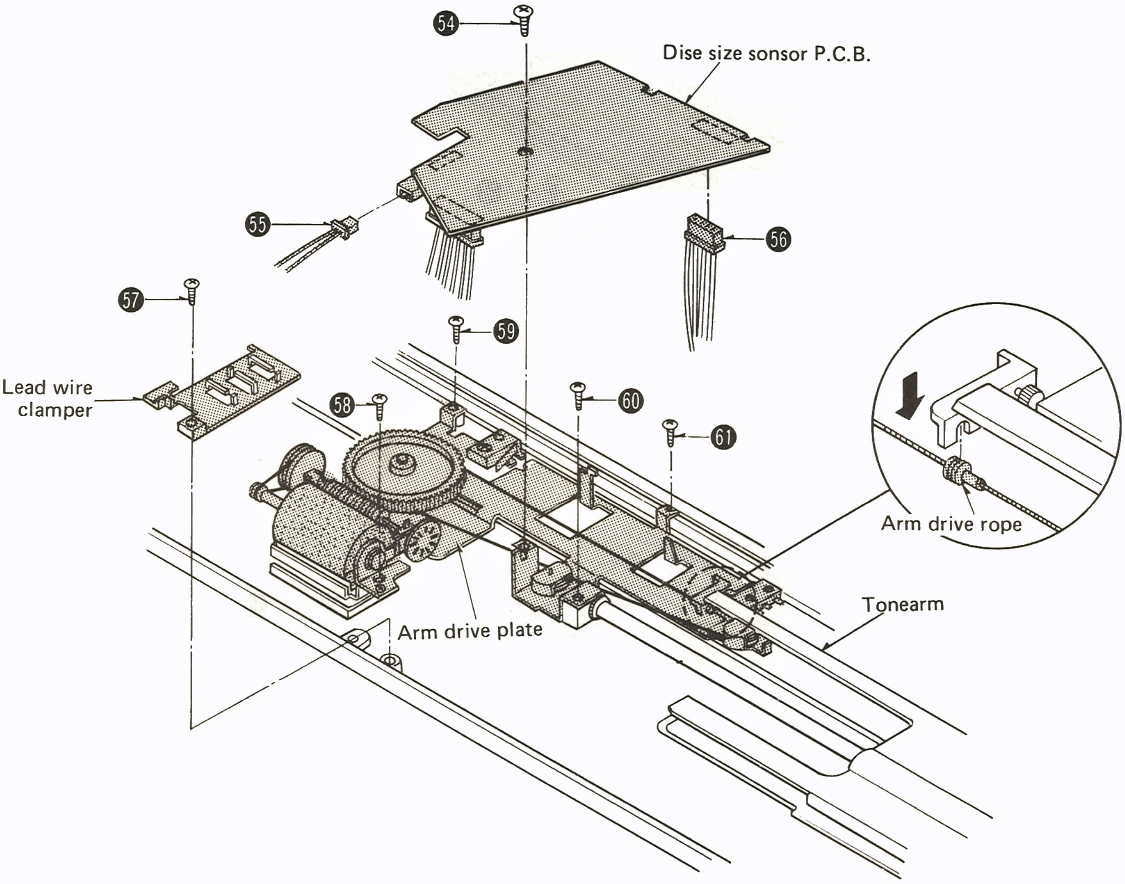

(54)
Dise size sonsor P.C.B.
(55)
(56)
(57)
Lead wire clamper
(59)
(58)
(60)
(61)
Arm drive rope
Tonearm
Arm drive plate

Fig. 12

• How to remove the tonearm

1. Remove the upper cabinet. **(Refer to "How to remove the upper cabinet.")**
2. Remove the arm drive plate. **(Refer to "How to remove the arm drive plate and disc size sensor P.C.B.")**
3. Remove the tonearm guide rail setscrew (62) and lead wire clamper setscrews (63) , (64). Then the tonearm can be removed. **(Fig. 13)**

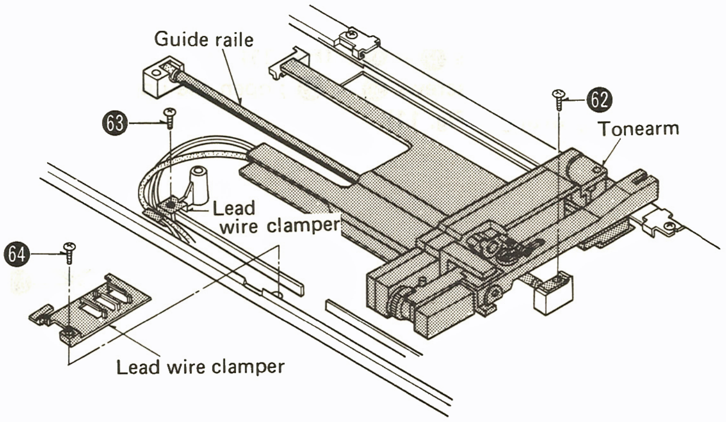
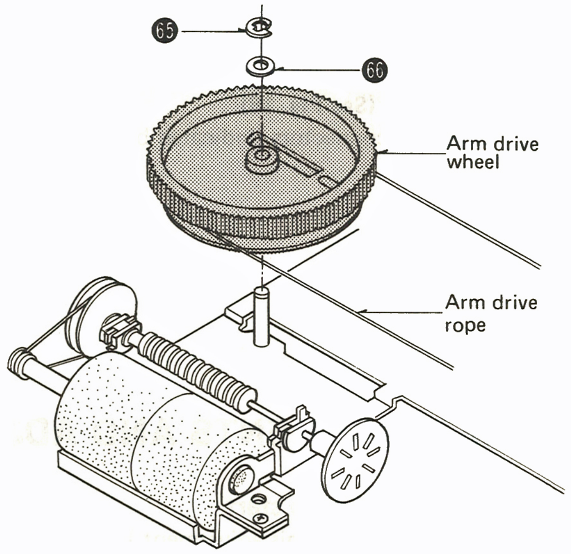

Guide raile
(62)
Tonearm
(63)
Lead wire clamper
(64)
Lead wire clamper

Fig. 13

■ HOW TO SET THE TONEARM DRIVE ROPE

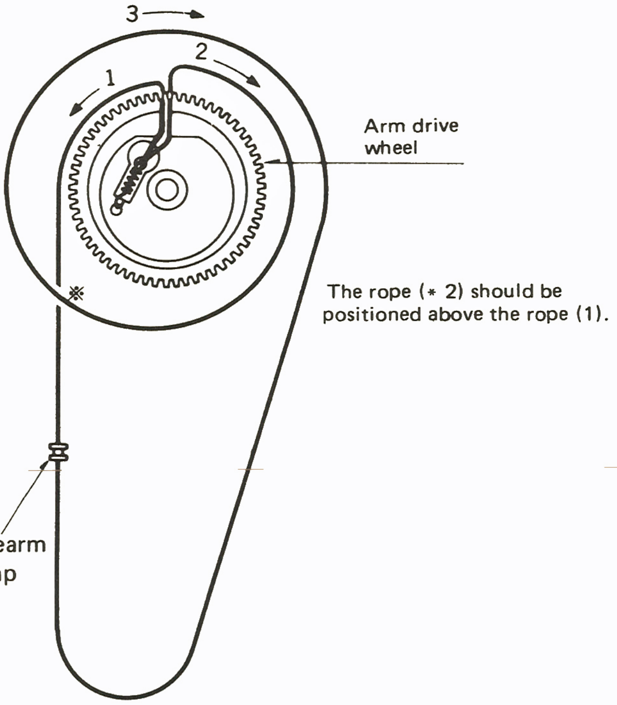
If the rope is disengaged or when setting a new rope, follow the procedure below.

1. Remove the upper cabinet cover.
   (Refer to "Disassembly instructions.")
2. Remove the E-ring ㊵ and washer ㊶ to remove the arm drive wheel. **(Fig. 14)**
3. Turn over the arm drive wheel, and set the rope according to the steps 1 ~ 3 in **Fig. 15.**
4. Holding the rope set over the arm drive wheel, set the drive wheel and rope according to the steps 4 ~ 5 in **Fig. 16.**
5. After setting the rope, rotate the worm gear by hand to adjust the tonearm and rope connector positions, and secure them.
6. Rotate the worm gear by hand to check that the tonearm moves smoothly.
7. Mount the E-ring ㊵ and washer ㊶ .



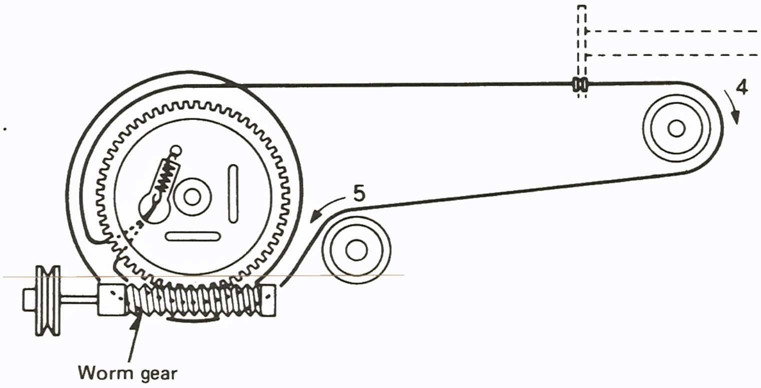
㊵
㊶
Arm drive wheel
Arm drive rope

Fig. 14



3
2
1
Arm drive wheel
※
The rope (* 2) should be positioned above the rope (1).
Tonearm cramp

Fig. 15



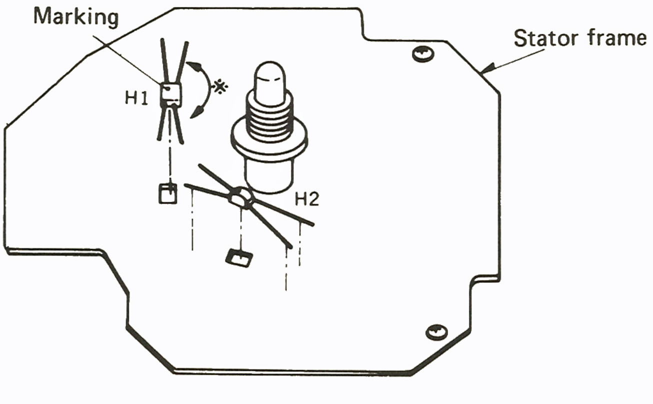
4
5
Worm gear

Fig. 16

■ REPLACEMENT OF HALL ELEMENT

When replacing the Hall element of the stator frame, be sure to place it with the marking side up as shown **Fig. 17.**

* The leg position is not specified provided that the marking side is up.



Marking
Stator frame
H1
※
H2

Fig. 17

■ DESCRIPTION OF CONNECTOR

Two types of connectors are used for this unit: one is directly soldered to the printed circuit board, and the other is insertion type.
The insertion type is represented by "CN", while the direct soldering type is by "BT". **(See Fig. 18)**
Note: Soldered connectors (indicated by BT) cannot be pulled out.

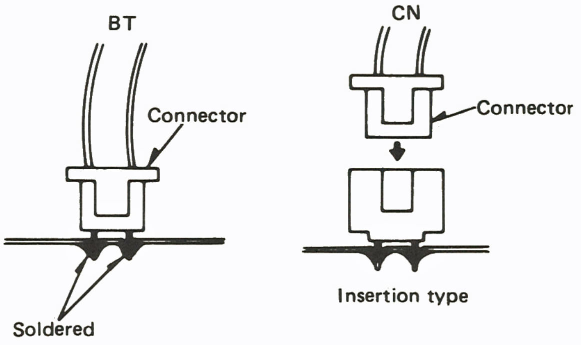


Fig. 18

■ MEASUREMENTS AND ADJUSTMENTS English

• Adjustment of auto start

(Use a 30cm disc for this adjustment.)

1. Remove the surface plate. **(Refer to "Disassembly instructions.")**
2. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
3. Insert the screwdriver into the adjusting hole. **(Fig. 19)**
   - *The start position is too much inside:
     Turn the screwdriver counterclockwise.
   - *The start position is too much outside:
     Turn the screwdriver clockwise.
4. If the start position is still deflected, turn the auto start position adjusting screw. **(Fig. 19)**
   - *The start position is too much inside:
     Turn it clockwise.
   - *The start position is too much outside:
     Turn it counterclockwise.
5. After the adjustment, be sure to lock the adjusting screw with bond.

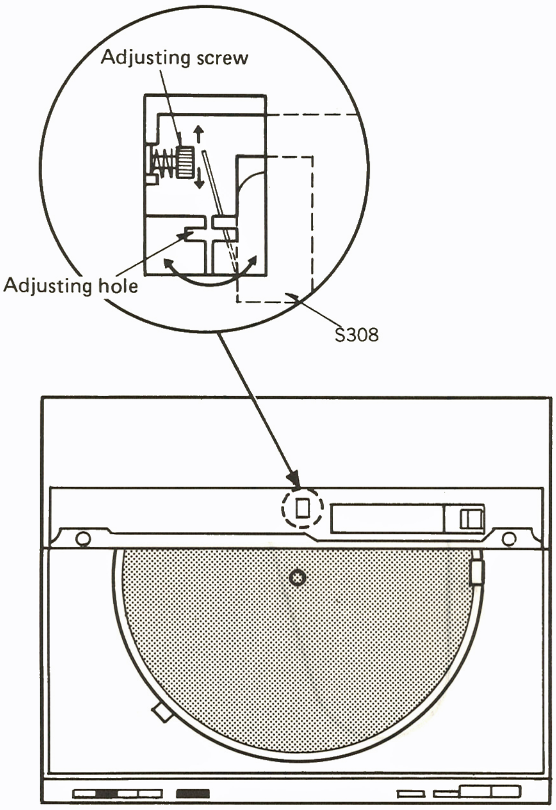


Fig. 19

• Adjustment for the stylus pressure

Stylus pressure is normally set to 1.25 g but may be raised or lowered by ± 0.25 g. It may be necessary to increase stylus pressure when playing records cut at high levels, or when room temperature is low, or when the unit easily picks up external vibrations. This will halp prevent distortion and groove-skipping. In such cases turn the screw clockwise (+) so the dial scale shows the desired stylus pressure, as indicated in the illustration. **(Fig. 20)**

Note: Do not turn the stylus-pressure adjustment screw further than the set limits (1.5 g ~ 1.0 g).

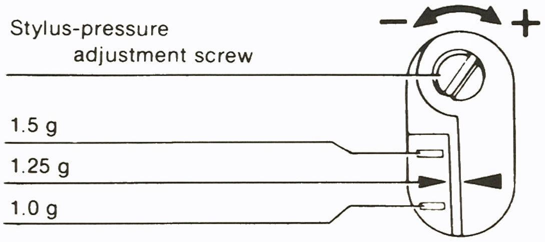


Fig. 20

• Offset adjustment of tonearm and servo gain

After repair of the tonearm and arm drive circuit, make the adjustment according to the following procedure.

Tools and equipment used

1. DC electronic voltmeters (VTVM).
2. 1mm pitch record.
3. Flat head screwdriver (small).
4. Phiplips head screwdriver (small).
5. Hexagon wrench (M1.5).

Condition of the set

1. Remove the dust cover and surface plate. **(Refer to "Disassembly instructions.")**
2. Turn the reset switch (S307) "on" by pressing it with tape. **(Fig. 21)**
3. Remove the rear cover. **(Refer to "Disassembly instructions.")**
4. Completely open the upper cabinet and make sure that the tonearm operates when the start button is pressed.

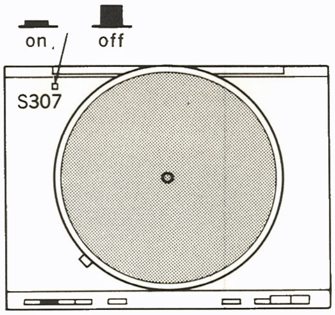
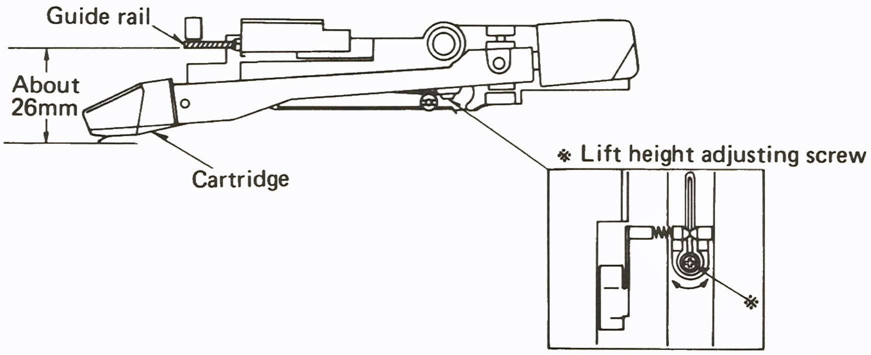
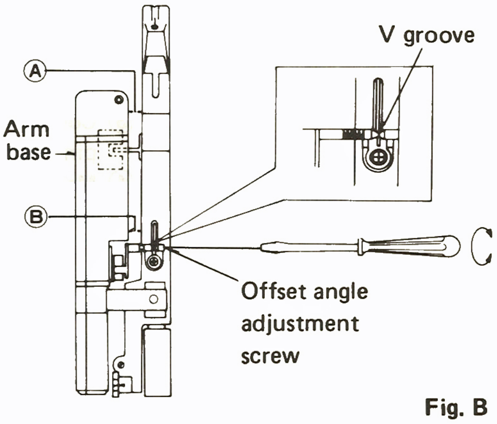
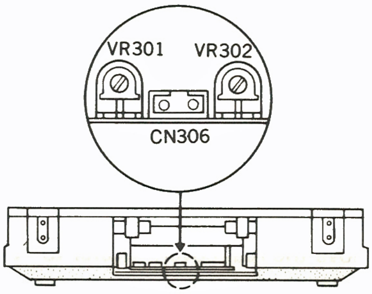
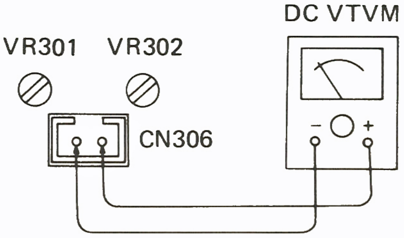
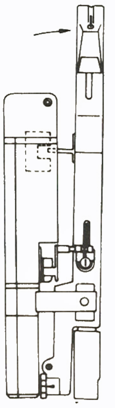
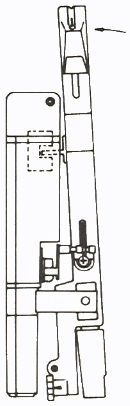
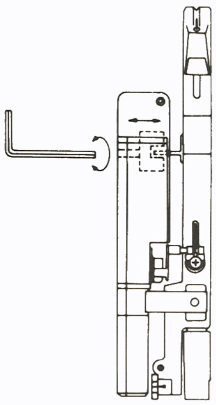
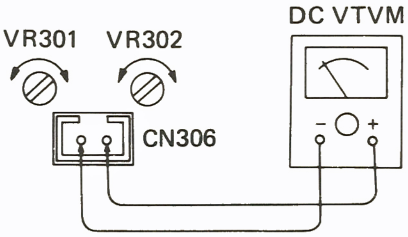


Fig. 21

Note: The tonearm does not operate with the turntable removed.

Step	**Item**	**Adjustment method**
1	**Adjustment of arm lift height (See Fig. A)**	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Press the cueing button to check that the clearance between the cartridge stylus and the guide rail is about 26mm. ③ If the clearance is incorrect, adjust the lift height by turning the adjusting screw with a flat head screwdriver. – Turn clockwise when excessive (> 26mm). – Turn anticlockwise when insufficient (< 26mm). **Note:** The lift height adjusting screws of the replacement tonearm is completely tightened up. So, loosen the adjusting screw before making the above adjustment.  Guide rail About 26mm Cartridge ※ Lift height adjusting screw ※ **Fig. A**
2	**Offset angle adjustment of tonearm (See Fig. B)**	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Make sure that the arm center is aligned with the V groove of the lift lever. ③ Make sure that the arm base is in parallel with the arm. (Check the clearance between Ⓐ and Ⓑ in **Fig. B.**) ④ If the arm base is not in parallel with the arm, adjust it by turning the offset angle adjusting screw.  Ⓐ Arm base Ⓑ V groove Offset angle adjustment screw **Fig. B**

Step	Item	Adjustment method
3	**Adjustment of tonearm sensitivity**	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Press the cueing button and make sure that the arm is lowered. ③ Connect the DC VTVM to the connector pin. **(See Fig. C, D)** ④ Read the voltage values with the tonearm fully shifted to the right and left respectively. **(See Fig. E, F)** ⑤ Calculate the center voltage from the difference between the two voltage values. For example, when the voltage is 1.5V in **Fig. E** and 0.02V in **Fig. F** then $\frac{(1.5V - 0.02V)}{2} + 0.02V = 0.76V$ (middle point voltage) ⑥ Set the tonearm to the center position, and turn the adjusting screw of the arm base by a haxagon wrench until the center voltage is achieved. **(See Fig. G)**  **Fig. C**  **Fig. D**  **Fig. E**  **Fig. F**  **Fig. G**
4	**Servo gain and offset adjustment**	① Put a recrod on the turntable. ② Open the dustcover 1 or 2 cm, turn the power switch "on" and lower the tonearm. (In this case, do not allow the stylus to touch the disc.) ③ Connect the DC VTVM to the connector pin. **(See Fig. H)** ④ Make sure that VR301 has been completely turned clockwise. ⑤ Turn VR302 until the DC VTVM indicates 0.72V: **(Servo gain adjustment)** ⑥ Put a 1 mm-pitch record on the turntable, close the dust cover, and play the record. ⑦ Turn VR301 until the DC VTVM indicates 0.6V. **(Offset adjustment)**  **Fig. H**

• Adjustment of rotational speed

After replacement of drive IC (IC101) and variable resistors (VR101, 102) or when the rated speed is not obtained by turning the pitch control knob, perform the adjustment according to the following procedure.

1. Remove the bottom plate. **(Refer to "Disassembly Instructions".)**
2. Place the set on the player repair table. **(See Fig. 22.)**
3. Put on the record and play. (Or, set the reset switch S307 to "on" and the record size selection knob to "30 cm"; rotate the turntable with the upper cabinet opened.)
4. Push the speed selector button to "45 r.p.m.".
5. Turn the pitch control knob to central position.
6. Adjust VR101 by the screwdriver from under the set until the rated speed (45 r.p.m.) is obtained while checking it through the stroboscope. **(See Fig. 23.)**
7. Push the speed selector button to "33 r.p.m.".
8. Adjust VR102 by the screwdriver until the rated speed (33-1/3 r.p.m.) is obtained while checking it through the stroboscope. **(See Fig. 23.)**
9. After completing the above-mentioned adjustment, check that the rated speeds can be obtained by pushing the speed selector button.

Note: Be sure to perform the adjustment of 45 r.p.m. first.
As a simple method, it is also possible to adjust VR101 and VR102, removing the turntable. **(See Fig. 24.)**

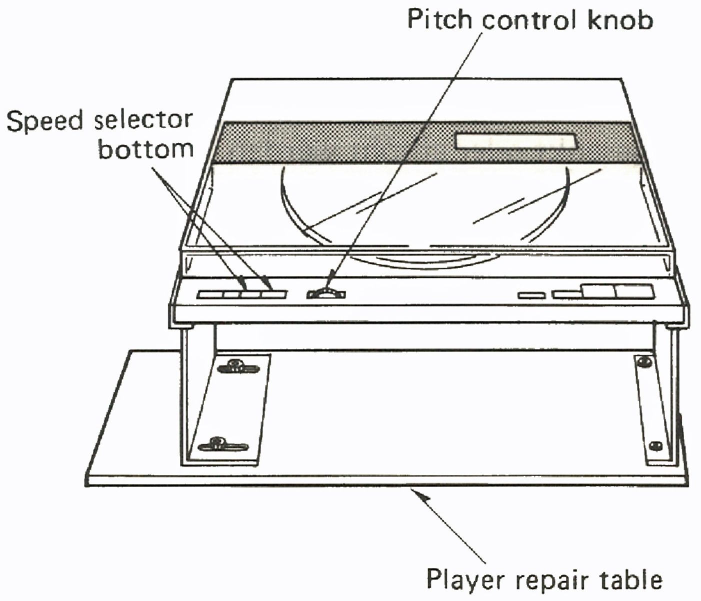


Fig. 22

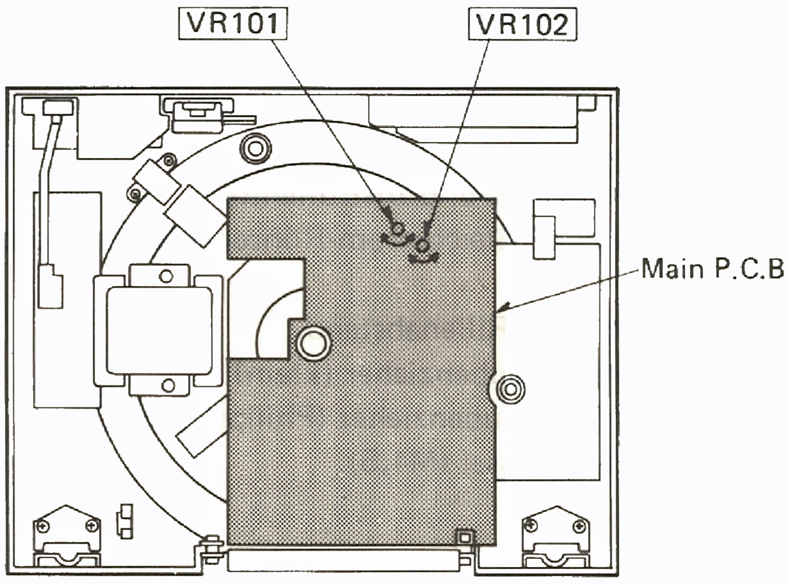


Fig. 23

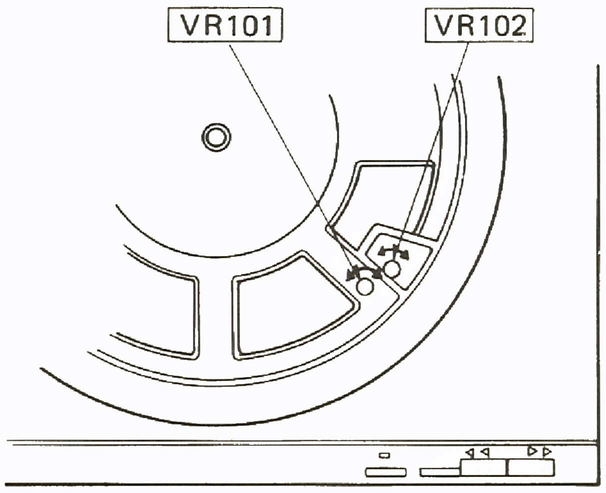


Fig. 24

■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

• Justierung der Auto-Start-Position

(Für diese Justierung ist eine 30cm-Platte zu verwenden.)

1. Die Deckplatte abnehmen. **(Siehe "Entfernen der Deckplatte".)**
2. Überprüfen, daß der Tonarm in der Start-Position ist (am Außenrand des Plattentellers).
3. Den Schraubenzieher in das Justierloch einführen. **(Abb. 19)**
   - *Die Start-Position ist zu weit innen: Den Schraubenzieher entgegen dem Uhrzeigersinn drehen.
   - *Die Start-Position ist zu weit außen: Den Schraubenzieher im Uhrzeigersinn drehen.
4. Wenn die Start-Position noch immer von der korrekten Position abweicht, die Auto-Start-Position-Justierschraube drehen. **(Abb. 19)**
   - *Die Start-Position ist zu weit innen: Im Uhrzeigersinn drehen.
   - *Die Start-Position ist zu weit außen: Entgegen dem Uhrzeigersinn drehen.
5. Nach erfolgter Justierung muß die Justierschraube mit Lack gesichert werden.

• Justieren Sie die Auflagekraft in den folgenden Fällen.

Die normale Auflagekraft beträgt 1,25 g, doch kann sie um ± 0,25g gesenkt oder erhöht werden.

Es könnte notwendig sein, die Auflagekraft zu erhöhen, wenn Platten abgespielt werden, die bei hohem Pegel geschnitten wurden, wenn die Raumtemperatur tief ist, oder wenn der Plattenspieler externer Vibration ausgesetzt ist. Dies hilft dabei, Verzerrung und Überspringen der Rillen zu vermeiden.

Drehen Sie die Schraube in einem solchen Fall im Uhrzeigersinn (+), bis die Skala die gewünschte Auflagekraft anzeigt, wie in der Skizze gezeigt. **(Abb. 20)**

Anmerkung:

Drehen Sid die Auflagekraft-Justierschraube nie weiter, als bis zu den Begrenzungen (1,5 g ~ 1,0 g).

• Reibungswinkel-Justierung des Tonarms und der Servo-Verstärkung

Nach der Reparatur des Tonarms und der Tonarm-Antriebsschaltung, sind die folgenden Justierungen durchzuführen.

Benötigte Werkzeuge und Instrumente

1. Elektronisches Gleichstrom-Röhrenvoltmeter oder Prüfgerät.
2. Platte mit 1mm-Rillenabstand.
3. Flachkopf-Schraubenzieher (klein).
4. Kreuzkopf-Schraubenzieher (Philips) (klein).
5. Sechskant-Schlüssel (M1,5).

Zustand des Gerätes

1. Die Staubabdeckung und die Plattentellerauflage entfernen. **(Siehe "Anleitung für die Zerlegung".)**
2. Den Deckelschalter (S307) durch Drücken mit Band einschalten. **(Abb. 21)**
3. Die Gehäuserückseite entfernen. **(Siehe "Anleitung für die Zerlegung".)**
4. Das obere Gehäuse vollständig öffnen und überprüfen, daß der Tonarm funktioniert, wenn die Start-Taste gedrückt wird.

Anmerkung: Der Tonarm funktioniert bei ausgebautem Plattenteller nicht.

Schritt	Einstell-Gegenstand	Justiermethode
1	**Justierung der Tonarm-Lifthöhe (Siehe Abb. A)**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifttaste drücken und überprüfen, daß der Abstand zwischen der Tonabnehmer-Nadelspitze und der Führungsschiene ca. 26mm beträgt. ③ Falls der Abstand nicht korrekt ist, die Lifthöhe durch Drehen der Justierschraube mit einem Flachkopf-Schraubenzieher justieren. – Bei zu großem Abstand: im Uhrzeigersinn drehen (> 26mm). – Bei zu kleinem Abstand: entgegen dem Uhrzeigersinn drehen (< 26mm). **Anmerkung:** Die Lifthöhe-Justierschraube des Ersatztonarms ist vollständig angezogen. Die Justierschraube ist daher vor dem Durchführen obiger Justierung zu lösen.
2	**Reibungswinkel-Justierung des Tonarms (Siehe Abb. B)**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Überprüfen, daß die Tonarmmitte mit der V-Kerbe der Liftachse übereinstimmt. ③ Überprüfen, daß der Tonarm parallel zum Tonarmträger ist. (Den Abstand zwischen Ⓐ und Ⓑ in **Abb. B** überprüfen.) ④ Falls der Tonarmträger nicht parallel zum Tonarm ist, durch Drehen der Reibungswinkel-Justierschraube justieren.

Schritt	Einstell-Gegenstand	Justiermethode
3	**Justierung der Tonarm-Empfindlichkeit**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifttaste drücken und überprüfen, daß der Tonarm abgesenkt wird. ③ Das Gleichstrom-Röhrenvoltmeter an die Anschlußstifte anschließen . **(Siehe Abb. C und D)** ④ Die Spannungswerte bei ganz nach rechts und dann nach links gestelltem Tonarm ablesen. **(Siehe Abb. E und F)** ⑤ Vom Unterschied zwischen den beiden Spannungswerten die Mittelspannung berechnen. Zum Beispiel, wenn die Spannung in **Abb. E** 1.5V, und in **Abb. F** 0,02V beträgt: $\frac{(1{,}5V - 0{,}02V)}{2} + 0{,}02V = \mathbf{0{,}76V}$ (Mittelpunkt-Spannung) ⑥ Den Tonarm in die Mittelposition stellen, und die Justierschraube der Armbasis mit dem Sechskantschlüssel drehen, bis die Mittelspannung erreicht wird. **(Siehe Abb. G)**
4	**Servo-Verstärkungs- und Reibungswinkel-Justierung**	① Eine Platte auf den Plattenteller legen. ② Die Staubabdeckung 1 oder 2 cm öffnen, den Netzschalter einschalten und den Tonarm absenken. (In diesem Fall darauf achten, daß die Abtastnadel die Platte nicht berührt.) ③ Das Gleichstrom-Röhrenvoltmeter an die Steckerstifte anschließen. ④ Überprüfen, daß VR301 bis zum Anschlag im Uhrzeigersinn gedreht worden ist. ⑤ VR302 drehen, bis das Gleichstrom-Röhrenvoltmeter, 0,72V anzeigt. **(Servo-Verstärkungs-Justierung)** ⑥ Die Platte mit 1mm-Rillenabstand auf den Plattenteller auflegen, die Staubabdeckung schließen, und die Platte abspielen. ⑦ VR301 drehen, bis das Gleichstrom-Röhrenvoltmeter 0,6V anzeigt. **(Reibungswinkel-Justierung)**

• Justierung der Drehzahl

Nach dem Auswechseln des Antriebs-IC (IC101) und die Drehwiderstände (VR101, 102), oder wenn die Nenndrehzahl durch Drehen des Drehzahl-Feineinstellers nicht erreicht werden kann, sind die folgenden Justierungen durchzuführen.

1. Die Bodenplatte abnehmen. **(Siehe "Ausbauen".)**
2. Die Gerät auf den Plattenspieler-Reparaturtisch stellen. **(Siehe Abb. 22)**
3. Eine Platte auflegen und abspielen. (Oder den Rückstellschalter S307 auf "on" und den Plattengröße-Wahlschalter auf "30 cm" stellen; der Plattenteller kann sich dadurch bei geöffnetem Gehäuseoberteil drehen.)
4. Den Drehzahl-Wahlschalter auf "45 U/min" einstellen.
5. Den Drehzahl-Feineinsteller in die Mitte stellen.
6. VR101 von der Unterseite her mit einem Schraubenzieher justieren, bis die Nenndrehzahl (45 U/min) anhand des Stroboskops festgestellt wird. **(Siehe Abb. 23)**
7. Die Drehzahl-Wahlschaltertaste auf "33 U/min" drücken.
8. VR102 mit dem Schraubenzieher justieren, bis die Nenndrehzahl anhand des Stroboskops festgestellt wird. **(Siehe Abb. 23)**
9. Nach dem Durchführen der obigen Justierungen überprüfen, daß die Nenndrehzahlen durch Drücken der Drehzahl-Wahlschaltertaste erreicht werden.
   Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.
   Eine einfache mögliche Justiermethode besteht darin, VR101 und VR102 nach Abnehmen des Plattentellers zu justieren. **(Siehe Abb. 24)**

■ MESURAGES ET MISES AU POINT Français

• Mise au point du démarrage automatique

(Utiliser un disque de 30 cm pour cette mise au point.)

1. Enlever la plaque ornementale. **(Se référer aux "Instructions pour le Démontage".)**
2. S'assurer que le bras de lecture est sur la position de démarrage (la périphérie la plus à l'extérieure de la platine).
3. Insérer le tournevis dans le trou de réglage. **(Fig. 19)**
   - *La position de démarrage est trop à l'intérieur: Tourner le tournevis dans le sens inverse des aiguilles d'une montre.
   - *La position de démarrage est trop à l'extérieur: Tourner le tournevis dans le sens des aiguilles d'une montre.
4. Si la position de démarrage est encore déviée, tourner la vis de mise au point du démarrage automatique. **(Fig. 19)**
   - *La position de démarrage est trop à l'intérieur: La tourner dans le sens des aiguilles d'une montre.
   - *La position de démarrage est trop à l'extérieur: La tourner dand le sens inverse des aiguilles d'une montre.
5. Après la mise au point, s'assurer de bloquer la vis de mise au point avec un adhésif.

• Mettre au point la force verticale d'appui de la pointe de lecture dans les cas suivants.

La force verticale d'appui de la pointe de lecture est normalement réglée sur 1,25 g, mais elle peut être augmentée ou diminuée de ± 0,25 g.

Il pourra être nécessaire d'augmenter la force verticale d'appui de la pointe lorsqu'on joue des disques enregistrés à des niveaux élevés, ou lorsque le tempèrature de la piéce est basse, ou encore lorsque l'appareil capte facilement des vibrations extérieures. Cela aidera à empêcher une distorsion et un sautillement des sillons. En pareils cas, tourner la vis de réglage dans le sens des aiguilles d'une montre (+), de façon à ce que la graduation du cadran indique la force verticale d'appui désirée de la pointe de lecture, comme il east montré sur l'illustration. **(Voir Fig. 20)**

Nota:

Ne pas tourner lar vis de réglage de la force verticale d'appui de la pointe de lecture plus que les limites de réglage admissibles (1,5 ~ 1,0 g).

• Mise au point du décalage du bras de lecture et de l'amplification servo-mécanique

Après la révision du bras de lecture et du circuit d'entraînement du bras, effectuer la mise au point suivante selon la procédure ci-dessous.

Outils et équipement à utiliser:

1. Vérificateur ou voltmètre électronique (VTVM) à C.C.
2. Disque à écarts de 1 mm.
3. Tournevis à tête plate (petit).
4. Tournevis à tête Philips (petit).
5. Clef hexagonale (M1,5).

Conditions du réglage:

1. Retirer le couvercle protège-poussière et la plaque de surface. **(Se référer aux "Instructions pour le Démontage".)**
2. Mettre "en marche" le commutatuer (S307) du couvercle en appuyant dessus avec un ruban. **(Fig. 21)**
3. Retirer le capot arrière. **(Se référer aux "Instructions pour le Démontage".)**
4. Ouvrir complètement le boîtier supérieur et s'assurer que le bras de leture fonctionne lorsqu'on appuie sur la touche de démarrage.

   Nota: Le bras de lecture ne fonctionne pas lorsque la platine est retirée.

Etape	Article	Méthode de réglage
1	**Mise au point de la hauteur d'élévation du bras (Voir Fig. A)**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage pour vérifier si l'intervalle entre la pointe de lecture de la cellule pick-up et le rail de guidage est d'à peu près 26 mm. ③ Si l'intervalle n'est pas suffisant, ajuster la hauter d'élévation en tournant la vis de réglage avec un tournevis à tête plate. – Tourner dans le sens des aiguilles d'une montre si l'intervalle est excessif (> 26 mm). – Tourner dans le sens inverse des aiguilles d'une montre si l'intervalle est insuffisant (< 26 mm). **Nota:** La vis de réglage de la hauteur d'élévation du bras de lecture de rechange est serrée à fond. Aussi, la desserrer avant d'effectuer la mise au point ci-dessus.
2	**Mise au point de l'angle de décalage du bras de lecture (Voir Fig. B)**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② S'assurer que le centre du bras soit aligné avec l'encoche en V du levier d'élévation. ③ S'assurer que le socle du bras soit parallèle au bras. (Vérifier l'intervalle entre Ⓐ et Ⓑ dans la **Fig. B**) ④ Si le socle du bras n'est pas parallèle au bras, l'ajuster en tournant la vis de réglage de l'angle de décalage.
3	**Mise au point de la sensibilité du bras du lecture**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage et s'assurer que le bras soit abaissé. ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. **(Voir les Figs. C et D)** ④ Observer les valeurs de tension avec le bras de lecture complètement orienté respectivement vers la droite et la gauche. **(Voir les Figs. E et F)** ⑤ Calculer la tension moyenne à partir de la différence entre les deux valeurs de tension. Par exemple, lorsque la tension est de 1,5V dans la **Fig. E** et de 0,02V dans la **Fig. F**, alors: $\frac{(1{,}5V - 0{,}02V)}{2} + 0{,}02V = \mathbf{0{,}76V}$ (tension du point intermédiaire) ⑥ Placer le bras de lecture sur la position du centre, et tourner la vis de réglage du socle du bras avec une clef kexagonale jusqu'à ce que la tension médiane soit obtenue. **(Voir Fig. G)**
4	**Mise au point du décalage et de l'amplification servomécanique**	① Placer un disque sur la platine. ② Ouvrir le couvercle protège-poussière de 1 à 2 cm, mettre "en marche" l'interrupteur d'alimentation et abaisser le bras de lecture. (Dans ce cas, ne pas laisser la pointe de lecture toucher le disque.) ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. ④ S'assurer que VR301 à été entièrement tourné dans le sens des aiguilles d'une montre. ⑤ Tourner VR302 jusqu'à ce que le voltmètre électronique à C.C. indique 0,72V. **(Mise au point de l'amplification servo-mécanique.)** ⑥ Placer un disque à écarts de 1 mm sur la platine, refermer le couvercle protège-poussière et faire jouer le disque. ⑦ Tourner VR301 jusqu'aà ce que le voltmètre électronique à C.C. indique 0,6V. **(Mise au point du décalage.)**

- **Réglage de la vitesse rotationnelle**

Après la remise en place du circuit intégré de commande (IC101) et des résistances variables (VR101, 102) ou lorsque la vitesse nominale de rotation n'est pas obtenue en tournant le bouton de réglage d'ecart, exécuter la mise au point selon le mode opératoire suivant.

1. Retirer le plateau inferieur. **(Se référer à "Comment démonter".)**
2. Placer l'appareil su la table de réparation pour électrophone. **(Voir Fig. 22)**
3. Placer dessus un disque et le faire jouer. (Ou, placer l'interrupteur de réenclenohement S307 sur "on" et la manette de sélection du diamètre de disque sur "30 cm"; faire tourner la platine en laissant le boîtier supérieur ouvert.)
4. Appuyer le bouton-commutateur de vitesse sur "45 r.p.m" (45 t/p.m.).
5. Tourner le bouton de réglage d'écart sur la position centrale.
6. Régler VR101 avec un tournevis à partir du dessous de l'appareil jusqu'à ce que la vitesse nominale de rotation (45 t/p.m) soit obtenue, tout en la vérifiant par l'intermédiaire du stroboscope. **(Voir la Fig. 23)**
7. Appuyer le bouton-commutateur de vitesse sur "33 r.p.m" (35 t/p.m.).
8. Régler VR102 avec un tournevis jusqu'à ce que la vitesse nominale de rotation (33 1/3 t/p.m.) soit obtenue, tout en la vérifiant par l'intermédiaire du stroboscope. **(Voir la Fig. 23)**
9. Après l'achèvement de la mise au point mentionnée cidessus, vérifier que les vitesses nominales de rotations peuvent être obtenues en appuyant sur la bouton-commutateur de vitesse.

Nota: S'assurer d'effectuer tout d'abord la mise au point pour 45 t/p.m.
Comme methode plus simplifiée, il est possible aussi de régler VR101 et VR102, en retirant la platine. **(Voir la Fig. 24)**

REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
4. Parts other than Ⓚ and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SL-DL1 (K)

Ref. No.		Part No.	Part Name & Description
MAIN CABINET PARTS			
1		SFTGQ11N01	Turntable Mat
2		SFTED11N01A	Turntable
3	○	SFACD11N01	Cabinet
3	Ⓚ	SFACD11N21	Cabinet (Black)
4		SFUMQ11N11	Cover, Rear
5		SFAZD11N01	Supporter, Hinge
6		SFUMQ11N01E	Knob Ass'y Start & Stop
7		SFUMD11N02	Cover, Indication Start & Stop
8		SFUMQ11N03	Guide, 33/45 Selector
9		SFUMD11N03	Cover, Indication 33/45 Selector
10		SFKTQ11N03	Knob, 33/45 Selector
11		SFKTQ11N04	Knob, Power
12		SFUMQ11N06	Shaft, Power Switch
13		SFUPQ11N04	Guide, Power Switch
14		SFGZD11N01	Spacer, L.E.D
15		SFDJQ11N02E	Connector Ass'y (6P)
16		SFUMC07–08	Holder, L.E.D
17		SFDJC07–05E	Connector Ass'y
18		SFUMD11N04	Panel, Strove
19		SFUMD11N05E	Strove Cover Ass'y
20		SFUMD11N01	Guide, Speed Adjustment
21		SFKTD11N01	Knob, Speed Adjustment
22		SFDJQ11N05E	Connector Ass'y (3P)
23 [E]		SFNND11S01	Name Plate
23 [EK, XL]		SFNND11G02	Name Plate
23 [EG, EB, EF, EH, EI]		SFNND11R01	Name Plate
23 [XA, XM]		SFNND11X01	Name Plate
24 [E, EH, EG, XM] EB, EF, XA]	⚠	**SJA88**	AC Cord
24 [EK] only	⚠	**QFC1205M**	AC Cord
24 [XL] only	⚠	**QFC1208M**	AC Cord
25		SFUM190–11	Bushing, AC Cord
25 [XL] only		SFUM190–12	Bushing, AC Cord
26		SFDHC07–01A	Phono Cord
27		SFUM190–11	Bushing, Phono Cord
28		SFMZD11N01Z	Stator Frame Ass'y
29		SFUZQ11N03	Shield Plate
30		SFUMQ11N05	Shaft, Connection
31		SFDSTWM9901A	Power Switche Supporter
32		SFGCQ11N04	Rubber, Power Transformer
33		SFUPQ11N09	Cover, Power Transformer
34		SFAUQ11N01E	Bottom Board
35		SFUPD11N03	Plate, Hinge
36		SFQCC07–01	Spring, Audio Insulator (Front)
37		SFQCQ11N01	Spring, Audio Insulator (Rear)
38		SFGAD11N01E	Audio Insulator
39		SFUZD11N01	Sheet, Knob Guide
40		SFDJD11N03E	Connector Ass'y (6P)
41		SFDJD11N02E	Connector Ass'y (3P)
42		SFDJQ11N01E	Connector Ass'y (8P)
43		SFDJD11N01E	Connector Ass'y (2P)
44		SFNHD11X01	Lable
45		SFGZD11N02	Spacer, L.E.D
46		SFUZD11N02	Spacer, Strove Panel
47		SFDBC07–01	Bushing, Transistor
UPPER CABINET PARTS			
50		SFUMQ11N12	Upper Cabinet Cover
51		SFNZC07–02	Lable Disc Size Selector
52		SFUPQ11N08	Guide, Upper Cabinet Cover
53		SFUMC07–16	Shutter
54		SFGCQ11N01	Cushion, Guide Rail
55		SFXJQ11N01	Guide Rail, Tonearm
56		SFUPC07–04	Supporter, Guide Rail
57		SFUPQ11N03	Guide Rail, Upper Cabinet
58		SFUPQ11N05	Supporter, Guide Rail
59		SFGCQ11N02	Cushion, Guide Rail
60	○	SFACQ11N02	Upper Cabinet (Silver)
60	Ⓚ	SFACQ11N04	Upper Cabinet (Black)

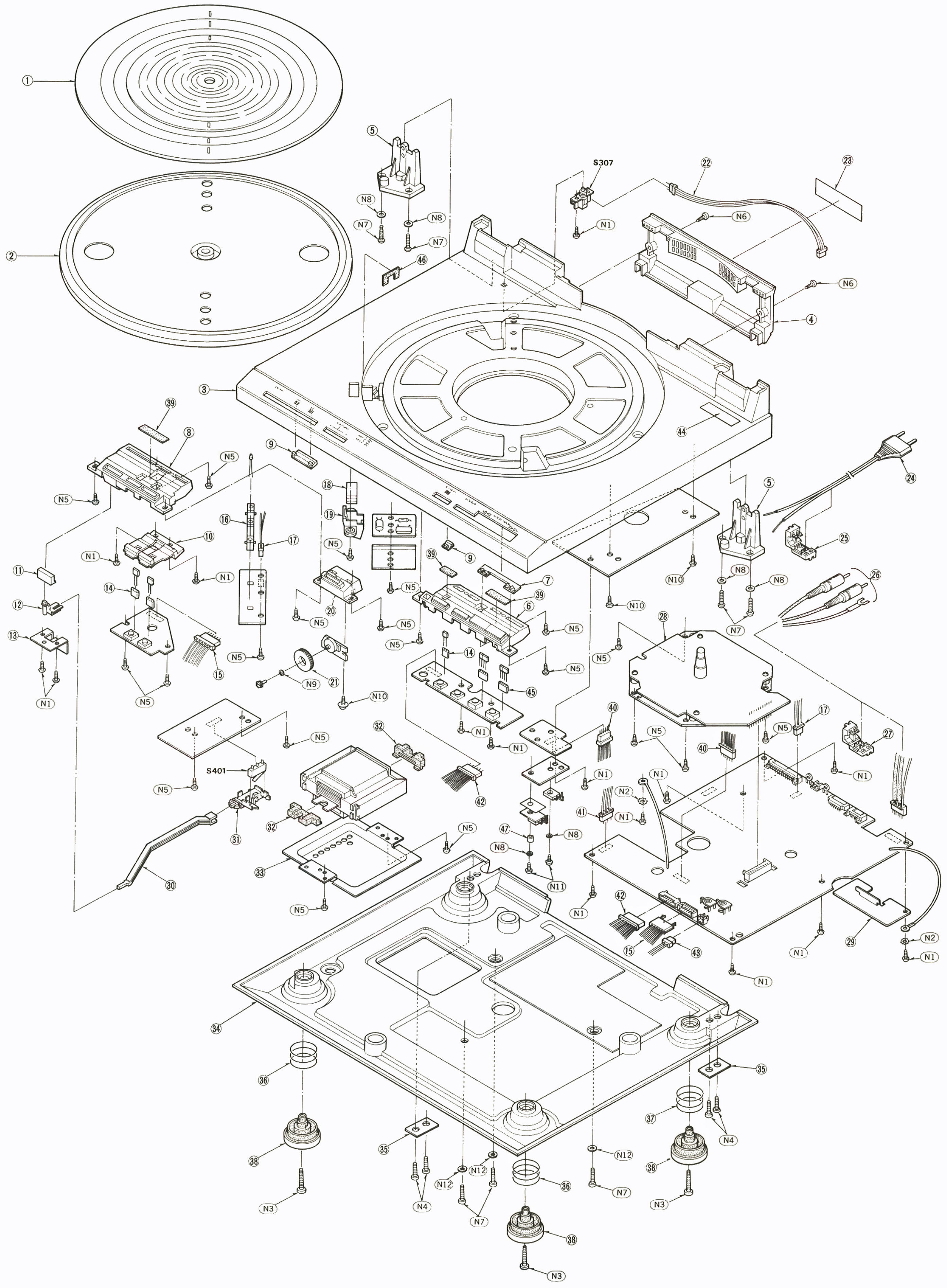
Ref. No.		Part No.	Part Name & Description
61		SFADD11N01E	Dust Cover
62		SFUMC07–09	Guide, Lead Wire
63		SFKKD11N01	Surface Plate
64		SFATQ11N02A	Hing
65		SFUPC07–01E	Arm Drive Plate
66		SFUPC07–07	Clamper, Lead Wire
67		SFUMC07–23	Pulley
68		SFUMC07–22	Stopper, Pulley
69		SFUMC10–05	Arm Drive Wheel
70		SFDJC10–02E	Connector, 4 Pin (With Wire)
71		SFXZC07–01R	Worm Ass'y
72		SFGBC10–01	Belt, Arm Drive
73		SFUZC07–05E	Arm Drive Rope
74		SFMHC07–01E	Arm Drive Motor
75		SFGCQ11N03	Cushion, Arm Drive Motor
76		SFUPQ11N15	Supporter, Arm Drive Motor
77		SFDJC07–01E	Connector, 12 Pin (With Wire)
78		SFUZQ11N02	Lable, Surface Plate
TONEARM PARTS			
101		SFPAM00701A	Tonearm
102		EPCP23SK	Cartridge
		EPS–23CS	Stylus
103		SFPCS00701A	Tonearm Position Indicator
104		SFPKD00701E	Arm Base
105		SFDZC07–01E	Cueing Plunger (RL501)
106		SFPJL00701A	Lift Ass'y
107		SFPSP01505	Spring, Lift Ass'y
108		SFPKD00702	Arm Base Cover
109		SFPSP00706	Spring, Rest Position Adjustment
110		SFDJC07–03E	Connector, Phono (With Wire)
111		SFDJC07–02E	Connector, 5 Pin (With Wire)
113		SFPGM00702	Cushion, Lead Wire
114		SFPZB00709	Bracket, Arm Base
115		SFGZ172–01	Spacer, Arm Base Cover
SCREWS, WASHERS and CIRCLIPS			
N1		**XTV3+8BFN**	Screw, Tapping, ⊕ 3 x 8
N2		**XWC3B**	Washer, ϕ3
N3		**XTV3+20BFN**	Screw, Tapping, ⊕ 3 x 8
N4		**XTN4+12BFZ**	Screw, Tapping, ⊕ 4 x 20
N5		**XTV3+10BFN**	Screw, Tapping, ⊕ 3 x 10
N6		**XTV3+10BFZ**	Screw, Tapping, ⊕ 3 x 10
N7		XTV3+14BFZ	Screw, Tapping, ⊕ 3 x 14
N8		**XWA3B**	Washer, ϕ3
N9		**XWA2B**	Washer, ϕ2
N10		SFXG172–01	Screw
N11		**XSN3+8S**	Screw
N12		**XWE3**	Washer
N13		**XTV3+16BFZ**	Screw, Tapping, ⊕ 3 x 16
N14		**XTN3+8BFZ**	Screw, Tapping, ⊕ 3 x 8
N15		**XTV3+6BFN**	Screw, Tapping, ⊕ 3 x 6
N16		XYN23+C10BN	Screw, Tapping, ⊕ 2.3 x 10
N17		**XTS26+6B**	Screw, Tapping, ⊕ 2.6 x 6
N18		SFXGQ11N01	Screw, Dust Cover
N19		SFXWQ11N01	Washer, Dust Cover
N20		XYC4+CJ20FZ	Screw, Tapping, ⊕ 3 x 20
N21		**XUC3FT**	Circlip, ϕ3
N22		SFXW551D2	Washer
N23		**XTV3+8BFZ**	Screw, Tapping, ⊕ 3 x 8
N24		XXE3D6FZ	Screw, Offset Angle Adjustment
N25		**XTN23+6BFZ**	Screw, Tapping, ⊕ 2.3 x 6
N26		XTN3+4B	Screw, Tapping, ⊕ 3 x 4
N27		SFPEV00702	Screw, Tonearm
N28		**XSN2+4BV**	Screw, Tapping, ⊕ 2 x 4
N29		XXE3D3FZS	Screw, Tonearm
N30		SFXGC10–06	Screw
N31		SFXWQ11N05	Washer, Upper Cabinet Cover
N32		SFXWQ11N04	Washer, Dust Cover
ACCESSORIES			
A1 [E] only		SFNUD11S01	Instructions Book, Printed Matter
A1 [EK] only		SFNUD11G01	Instructions Book, Printed Matter
A1		SFNUD11X01	Instructions Book, Printed Matter
A2		SFWE212–01	45 Adaptor
A3 [XA, XM] only		SFKDI19118	2 Pin Plug
PACKING PARTS			
P1	○	SFHPD11M01	Carton Box (Silver)
P1 [EF] only	○	SFHPD11C01	Carton Box (Silver)
P1	Ⓚ	SFHPD11M21	Carton Box (Black)
P2		SFHHQ11N01	Pad, Front
P3		SFHHQ11N02	Pad, Rear
P4		SFHDQ11N01	Pad, Top
P5		SFHSD11N03	Cabinet Spacer
P6		SFHSD11N01E	Arm Spacer
P7		SFHSD11N02	Dust Cover Spacer
P8		SFYH60X60	Polyethylene Bag, Unit
P9		SFYH40X45	Polyethylene Bag, Turntable
P10		SFYF09A15	Polyethylene Bag, 45 Adaptor
P11 [XA, XM] only		SFHSC07–02	Spacer (A), Corner
P12 [XA, XM] only		SFHSC07–03	Spacer (B), Corner

Areas

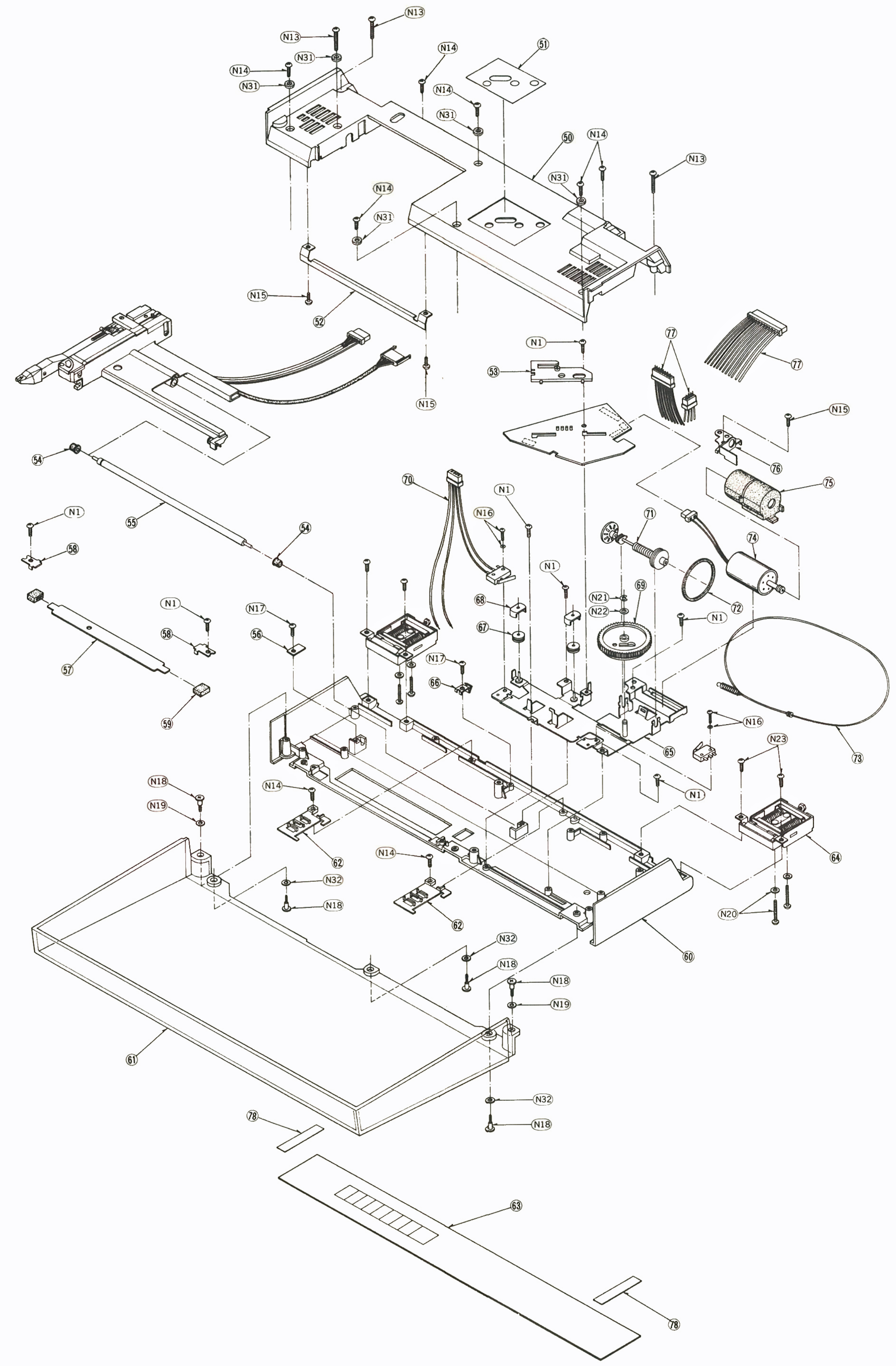
- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

■ EXPLODED VIEW

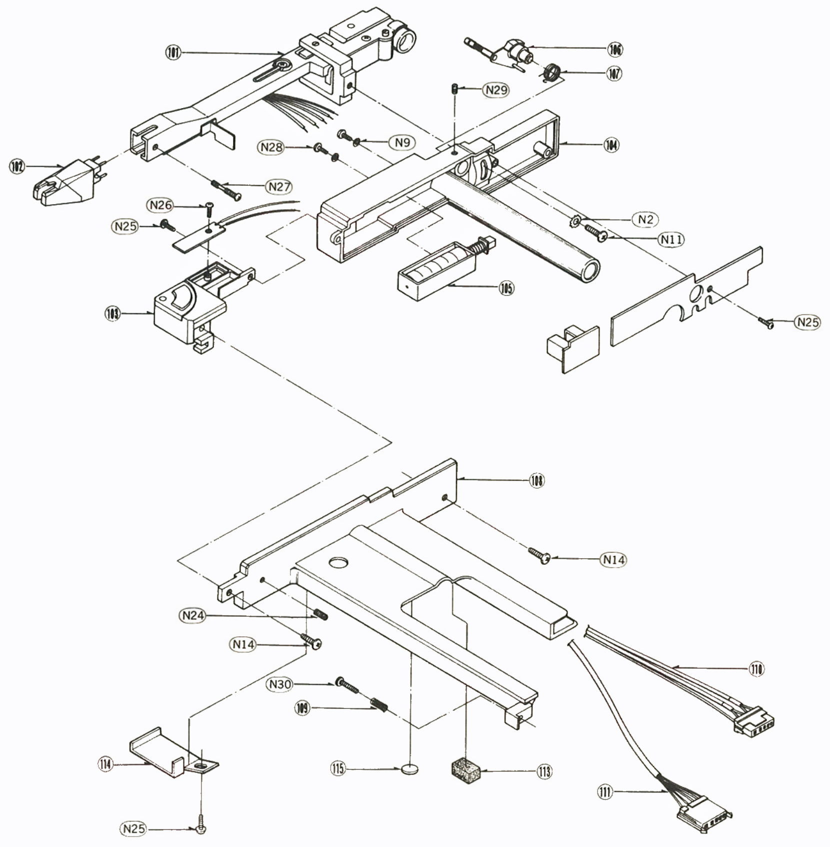
Main Cabinet



Upper Cabinet



Tonearm



■ REPLACEMENT PARTS LIST...Electrical Parts

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

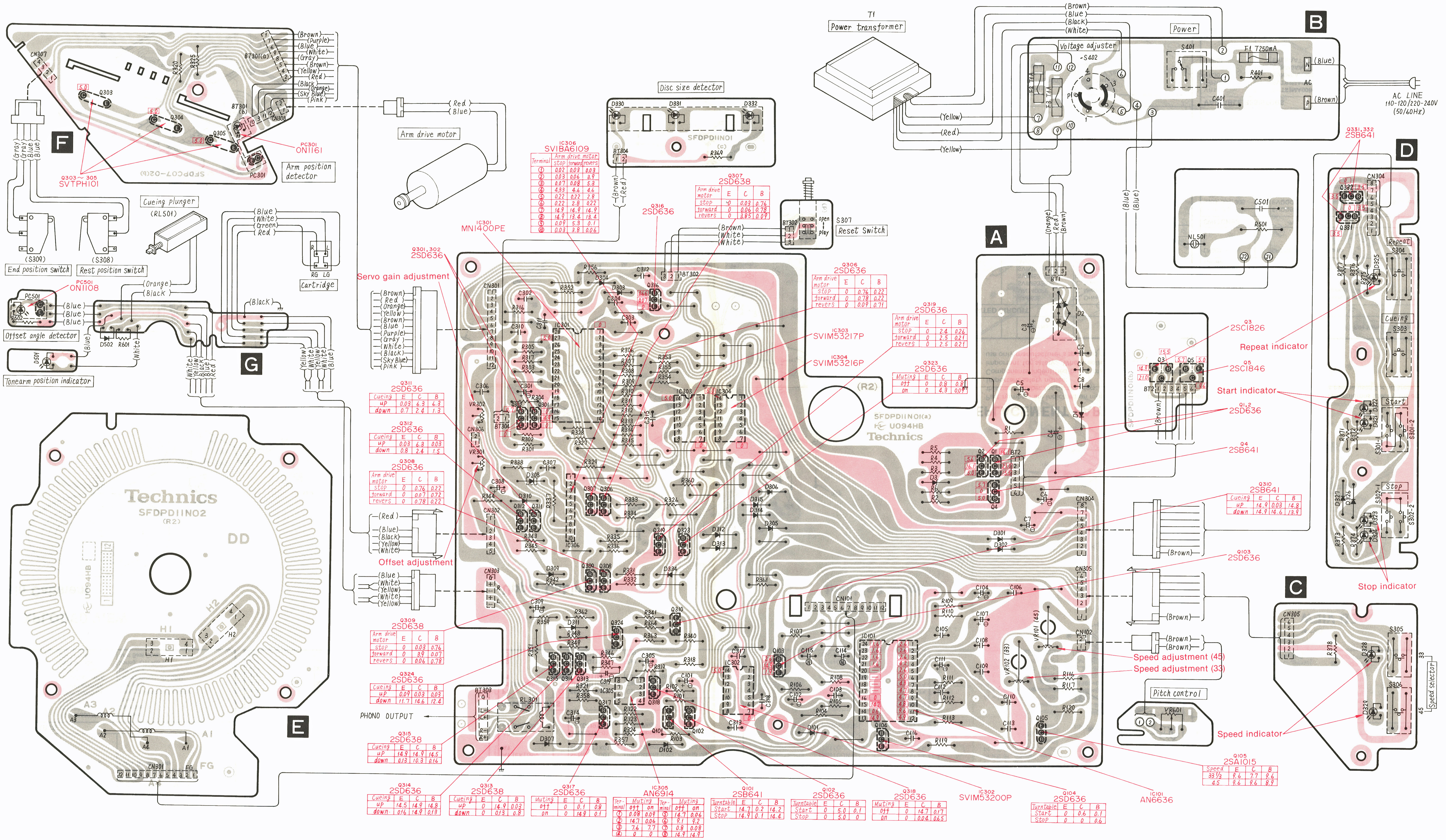
Ref. No.		Part No.	Part Name & Description
INTEGTATED CIRCUIT			
IC101		AN6636	IC, Drive
IC301		MN1400PE	IC, Micro-Computer
IC302		SVIM53200P	IC, Nand
IC303		SVIM53217P	IC, Buffer
IC304		SVIM53216P	IC, Inverter
IC305		AN6914	IC, Compareter
IC306		SVIBA6109	IC, Arm Motor Drive
TRANSISTORS			
Q1, 2		2SD636	Transistor, Regulator & Drive Detector
Q3		2SC1826	Transistor, Regulator
Q4, 101		2SB641	Transistor, Regulator & Drive Detector
Q5		2SC1846–R	Transistor, Regulator
Q102 ~ 104		2SD636	Transistor, Regulator & Switching
Q105		2SA1015–Y	Transistor, Regulator
Q301, 302, 306 308, 311, 312 314, 316 ~ 319 323, 324		2SD636	Transistor, Buffer Switching & Muting Relay Drive
Q303 ~ 305		SVTPH101–Q2	Photo Transistor, Disc Size Detector
Q307, 309, 313 315		2SD638	Transistor, Buffer
Q310, 331, 332		2SB641	Transistor, Switching
DIODES			
D1	⚠	SVDRM1Z	Diode
D2	⚠	SVDS1RBA20Z	Diode, Rectifier
D3		MA1051A	Diode, 5.1V Zener
D101, 301 ~ 307 309 ~ 311, 314 315, 334		**MA162A**	Diode
D102, 312, 313		**20A90**	Diode
D308		**MA26TO–A**	Diode
D321 ~ 325		SVDPR5531K	Light Emitting Diode, Red
D326, 327		**20A90**	Diode
D328, 329		SVDPR5531K	Light Emitting Diode, Red
D330 ~ 332		SVDAR3402S	Light Emitting Diode, Disc, Size Detector
D501		SVDEBR3432S	Light Emitting Diode, Arm Indicator
PHOTO INTERRUPTERS			
PC301		ON1161	Photo Interrupter, Arm Position Detector
PC501		ON1108	Photo Interrupter, Offset Angle Detector
RELAY			
RL301		SFDYQ11N01	Relay, Muting
RL501		SFDZC07–01E	Plunger, Cueing
LAMP			
LN501	⚠	SFDNE2HU	Lamp
SWITCHES			
S301, 302		EVQQBR08K	Switch, Start & Stop
S303, 304, 305 306		EVQQQB04K	Switch, Repeat, Cueing & Speed Selector
S307		ESB6247	Switch, Reset Switch
S308, 309		SFDSD2MSL–4	Switch, Rest & End Detector
S401	⚠	SFDSSS5GLS	Switch, Power Source
S402	⚠	SFDSHXW01317	Switch, Voltage Adjuster
FUSES			
F1	⚠	XBAS2C025T1A	Fuse, T250mA, 250V
F2, 3	⚠	XBA2C10TR0	Fuse, T1A, 250V
VARIABLE RESISTORS			
VR101		**EVTS3MA00B54**	Speed Adjustment (45) 50kΩ (B)
VR102		**EVTS3MA00B24**	Speed Adjustment (33) 20kΩ (B)
VR301		**EVNM0AA00B14**	Offset Adjustment 10kΩ (B)
VR302		**EVNM0AA00B13**	Servo Gain Adjustment 1kΩ (B)
VR601		EVLEAAT12B24	Pitch Control 20kΩ (B)
POWER TRANSFORMER			
T1	⚠	SLT66PS7E	Power Transformer
HALL ELEMENT			
H1, 2		H–300A	Hall Element, Turntable Position Detector

Continued on page 31

25 ■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

🟥 Ground (Earth) Lines

26


F
T1
Power transformer
B
Power
Voltage adjuster
S401
S402
F1 T250mA
R401
C401
AC LINE
110-120/220-240V
(50/60Hz)
Disc size detector
D330
D331
D332
SFDPDIIN01
Arm drive motor
Arm position detector
PC301
ON1161
Q303 ~ 305
SVTPH101
Cueing plunger
(RL501)
(S309)
End position switch
(S308)
Rest position switch
PC501
ON1108
Offset angle detector
Tonearm position indicator
G
Cartridge
S307
Reset Switch
IC306
SVIBA6109
IC301
MN1400PE
Q301, 302
2SD636
Servo gain adjustment
Q316
2SD636
Q307
2SD638
Q306
2SD636
Q319
2SD636
IC303
SVIM53217P
IC304
SVIM53216P
Q323
2SD636
Q311
2SD636
Q312
2SD636
Q308
2SD636
Offset adjustment
Q309
2SD638
Q324
2SD636
Q315
2SD638
PHONO OUTPUT
Q314
2SD636
Q313
2SD638
Q317
2SD636
IC305
AN6914
Q101
2SB641
Q102
2SD636
Q318
2SD636
IC302
SVIM53200P
Q104
2SD636
IC101
AN6636
Q105
2SA1015
A
SFDPDIIN01(a)
U094HB
Technics
D
Q331, 332
2SB641
Q3
2SC1826
Repeat indicator
Q5
2SC1846
Start indicator
Q1, 2
2SD636
Q4
2SB641
Q310
2SB641
Q103
2SD636
Stop indicator
C
Speed adjustment (45)
Speed adjustment (33)
Pitch control
VR601
Speed indicator
Speed selector
Repeat
Cueing
Start
Stop
E
Technics
SFDPDIIN02
(R2)
DD
H1
H2
A1
A2
A3
FG

■ SCHEMATIC DIAGRAM (This schematic diagram may be modified at any time with the development of new technology.)

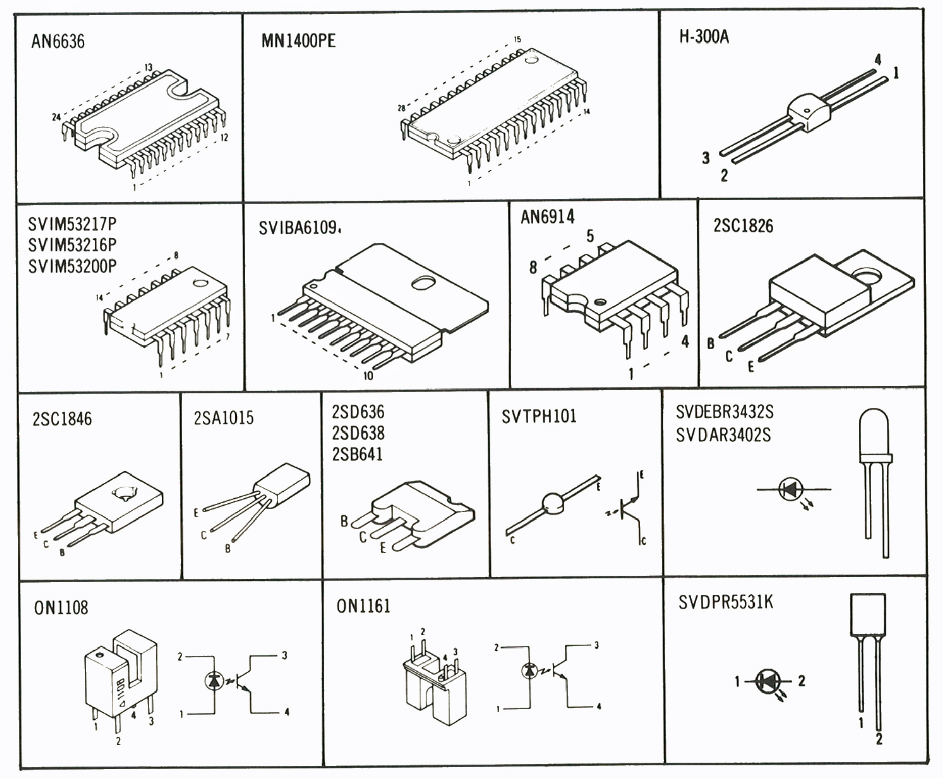
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
A B C D E F G H I
• Products for [EK], [EB], [EF], [EG], [EI], and [EH].
Power source circuit
B
AC Line (50/60Hz) 110-120/220-240V
F1 T250mA
R401 4.7
C401 0.047
S401 Power
S402
T1
BRN
WHT
BLK
BLU
YEL
RED
F3 T1A
F2 T1A
R501 10K
NL501
C501 0.01
• Products for [E], [XL], [XA] and [XM].
Turntable drive and logic control circuit
A
D2 SVDS1RBA20Z
TP1
TP2
TP3
TP4
TP5
BT1
BT2
ORG
Pitch control
Pitch Control
VR102
CN102
D1 SVDRM1Z
D101 MA150
D102 OA90
Q101 2SB641
Q102 2SD636
Q1, 2 2SD636
Q4 2SB641
Q3 2SC1826
Q5 2SC1846
D3 MA1051A
VR101 (45) 50K B
Speed adjustment (45)
IC101 AN6636
Q103, 104 2SD636
Q105 2SA1015
Speed adjustment (33)
D307 MA150
Muting
RL301
Q317 2SD636
Cartridge
BT303 PHONO OUTPUT
CN303
Stator circuit
E
CN101
H1, 2 H-300A
D330 ~ 332 SVDAR3402S
BT304
R369 470
TP58
BT302
S307 play open
Reset Switch
D328, 329 SVDPR5531K
Speed select
C
S305 (33)
S306 (45)
Speed Selector
CN305
D321 ~ 325 SVDPR5531K
D314, 315 MA150
D305, 306 MA150
IC304 SVIM5321GP
IC303 SVIM53217P
IC302
IC301 MN1400PE
D303, 304 MA150
D312, 313 OA90
IC306 SVIBA6109
IC305 AN6914
Q316 2SD636
IC302 SVIM53200P
Q331, 332 2SB641
CN304
D326, 327 OA90
S301-1 S301-2 start
S302-1 S302-2 stop
S303 Cueing
S304 Repeat
D
Operation circuit
D301, 302
Q301, 302 2SD636
D334 MA150
Q318, 319, 323 2SD636
Q307, 309 2SD638
Q306, 308 2SD636
D308 MA26TO-A
Offset adjustment
Q311, 312, 324 2SD636
Q313, 315 2SD638
Q314 2SD636
Servo gain adjustment
CN306
Q310 2SB641
D309 ~ 311 MA150
Tonearm position detection
End detection
Rest detection
Disc size sensor circuit
F
S309 END
S308 REST
PC301 ON1161
Q303 ~ 305 SVTPH101
CN307
CN308
MOTOR M
CN301
BT301
BT304
PC501 ON1108
D502 MA150
G
Arm circuit
Offset angle detection
RL501 Cueing
D501 SVDEBR3432S
ARM INDICATOR
CN302
CN501
14.9
5.0

Notes:

1. **S301-1, 301-2** : Start switch in "**off**" position. (not push condition).
   ◁◀ . . . . .Moves inward (S301-1)
   ◀◀ . . . . .Moves faster (S301-2)
2. **S302-1, 302-2** : Stop switch in "**off**" position. (not push condition).
   ▶▷ . . . . .Moves outward (S302-1)
   ▶▶ . . . . .Moves faster (S302-2)
3. **S303** : Cueing switch in "▼" position. (not push condition).
4. **S304** : Repeat switch in "**off**" position. (not push condition).
5. **S305, 306** : Speed select switch in "**off**" position. (not push condition).
   S305. . . . . 33-1/3 r.p.m. S306. . . . . 45 r.p.m.
6. **S307** : Reset switch in "**on**" position.
7. **S308** : Rest position switch in "**off**" position.
8. **S309** : End position switch in "**off**" position.
9. **S401** : Power switch in "**on**" position.
10. **S402** : Voltage adjuster switch in "**220 — 240V**" position.
    110 — 120V ←→ 220 — 240V
11. The value in ☐ is the standard voltage for this unit operated at 33-1/3r.p.m., which was measured by DC electronic voltmeter (high impedance) on the basis of the chassis. Accordingly, the voltage value may sometimes include a slight error depending on the internal impedance of the DC voltmeter (tester, etc.) used for the measurement.
12. ▬ +Ⓑ voltage line.
13. Important safety Notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

*** S309 (end detection switch) will be replaced by MN1400PE of which the end detection unit is built into MN1400PA (IC301) in the course of manufacture.**
At the time of servicing, it is possible to replace MN1400PA with MN1400PE, but not MN1400PE with MN1400PA. Incidentally, MN1400PE will be supplied as repair parts.

• Terminal guide of transistors, IC's, diodes and photo interrupters


AN6636
MN1400PE
H-300A
SVIM53217P
SVIM53216P
SVIM53200P
SVIBA6109
AN6914
2SC1826
2SC1846
2SA1015
2SD636
2SD638
2SB641
SVTPH101
SVDEBR3432S
SVDAR3402S
ON1108
ON1161
SVDPR5531K

• Reference voltage and waveform at each IC terminal (pin)

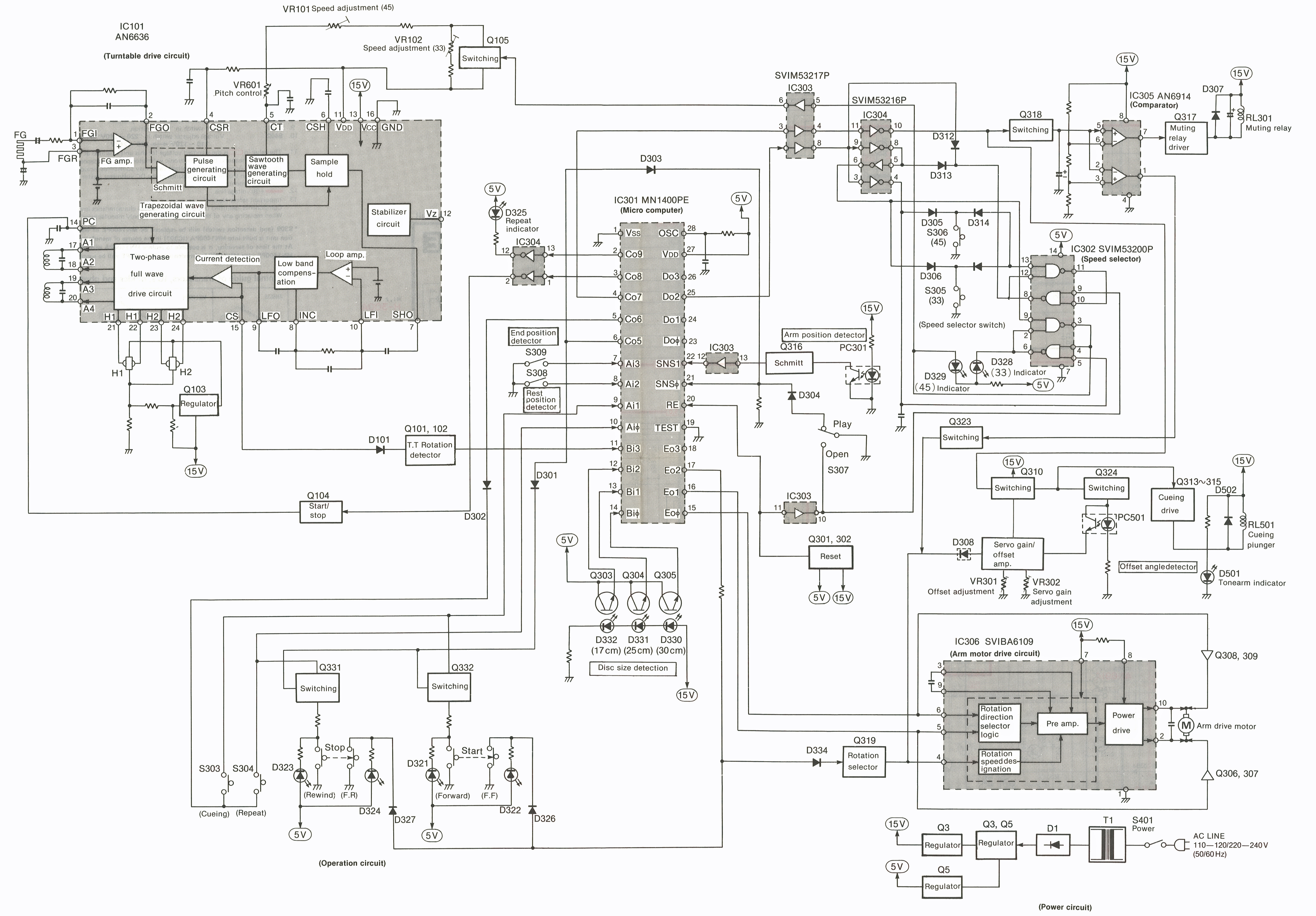
This indicated voltage values and waveform are measured by oscilloscope at 33r.p.m. rotation.

IC101 (AN6636)

	Stop	Start		Stop	Start		Stop	Start
①	2.6V	2.6V	⑥	8.1V	5.0V	⑰ ⑱ ⑲ ⑳	0V	※ Vp-p 4.0V
②	2.6V	20ms 2.4V 3.0V	⑦	7.8V	4.8V			
			⑧	0.26V	4.7V			
			⑨	0.23V	4.8V			
③	2.6V	2.6V	⑩	5.4V	4.8V			
④	9.3V	20ms 10V	⑪	9.6V	9.6V			
			⑫	5.0V	4.9V			
			⑬	14.9V	14.9V	㉑	1.58V	1.6V
⑤	8.7V	20ms 5.0V	⑭	0V	0.6V	㉒	1.54V	1.6V
			⑮	14.9V	14.7V	㉓	1.5V	1.6V
			⑯	0V	0 0V	㉔	1.6V	1.6V

※ **The waveform was obtained with oscilloscope connected between terminals ⑰ – ⑱, ⑲ – ⑳.**

■ BLOCK DIAGRAM


VR101 Speed adjustment (45)
VR102 Speed adjustment (33)
Q105 Switching
IC101 AN6636
(Turntable drive circuit)
VR601 Pitch control
15V
FG
FGI
FGR
FG amp.
Schmitt
FGO
CSR
Pulse generating circuit
Trapezoidal wave generating circuit
CT
Sawtooth wave generating circuit
CSH
Sample hold
VDD
VCC
GND
Stabilizer circuit
Vz
PC
A1
A2
A3
A4
Two-phase full wave drive circuit
Current detection
Low band compens-ation
Loop amp.
H1
H2
CS
LFO
INC
LFI
SHO
Q103 Regulator
15V
Q101, 102 T.T Rotation detector
D101
Q104 Start/stop
D302
D301
SVIM53217P IC303
SVIM53216P IC304
D312
D313
D303
5V
D325 Repeat indicator
IC304
IC301 MN1400PE
(Micro computer)
Vss
Co9
Co8
Co7
Co6
Co5
Ai3
Ai2
Ai1
Aiφ
Bi3
Bi2
Bi1
Biφ
OSC
VDD
Do3
Do2
Do1
Doφ
SNS1
SNSφ
RE
TEST
Eo3
Eo2
Eo1
Eoφ
5V
End position detector
S309
S308
Rest position detector
Arm position detector
Q316 Schmitt
PC301
IC303
D304
Play
Open
S307
IC303
Q301, 302 Reset
5V
15V
5V
Q303
Q304
Q305
D332 (17cm)
D331 (25cm)
D330 (30cm)
Disc size detection
15V
Q318 Switching
IC305 AN6914 (Comparator)
Q317 Muting relay driver
D307
RL301 Muting relay
15V
D305
D314
S306 (45)
D306
S305 (33)
(Speed selector switch)
IC302 SVIM53200P (Speed selector)
5V
D329 (45) Indicator
D328 (33) Indicator
5V
Q323 Switching
Q310 Switching
Q324 Switching
Q313~315 Cueing drive
D502
RL501 Cueing plunger
PC501
D308
Servo gain/ offset amp.
VR301 Offset adjustment
VR302 Servo gain adjustment
Offset angledetector
D501 Tonearm indicator
15V
IC306 SVIBA6109
(Arm motor drive circuit)
Rotation direction selector logic
Rotation speeddes-ignation
Pre amp.
Power drive
Arm drive motor
Q308, 309
Q306, 307
D334
Q319 Rotation selector
Q331 Switching
Q332 Switching
Stop
Start
S303
S304
(Cueing)
(Repeat)
D323
(Rewind)
(F.R)
D324
D327
D321
(Forward)
(F.F)
D322
D326
5V
5V
(Operation circuit)
15V
Q3 Regulator
Q3, Q5 Regulator
D1
T1
S401 Power
AC LINE 110—120/220—240V (50/60Hz)
5V
Q5 Regulator
(Power circuit)

Continued from page 23

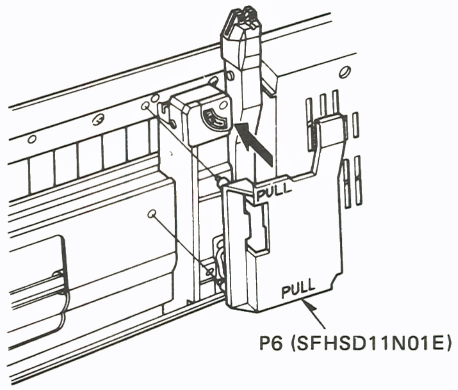
Ref. No.		Part No.	Part Name & Description
RESISTORS			
R1, 2		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R3		**ERD25FJ562**	Carbon, 1/4W, 5.6kΩ, ± 5%
R4		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R5		**ERD25TJ273**	Carbon, 1/4W, 27kΩ, ± 5%
R6		**ERD25FJ152**	Carbon, 1/4W, 1.5kΩ, ± 5%
R101		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R102		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R103		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R104		**ERX1ANJ2R2**	Metal Oxide, 1W, 2.2Ω, ± 5%
R105		**ERD25FJ220**	Carbon, 1/4W, 22Ω, ± 5%
R106		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R107		**ERD25FJ182**	Carbon, 1/4W, 1.8kΩ, ± 5%
R108		**ERD25FJ221**	Carbon, 1/4W, 220Ω, ± 5%
R109		**ERD25FJ820**	Carbon, 1/4W, 82Ω, ± 5%
R110		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R111		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R112		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R113		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R116		**ERO25CKF6802**	Metal Film, 1/4W, 68kΩ, ± 1%
R117		**ERD25TJ273**	Carbon, 1/4W, 27kΩ, ± 5%
R119		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R120		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R301		**ERD25TJ163**	Carbon, 1/4W, 16kΩ, ± 5%
R302		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R303		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R304		**ERD25FJ150**	Carbon, 1/4W, 15Ω, ± 5%
R305		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R306, 307		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R308, 309		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R310, 311		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R312		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R313, 314		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R315, 316		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R317		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R318		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R319		**ERD25FJ101**	Carbon, 1/4W, 100Ω, ± 5%
R320		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R321		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R322		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R323, 324		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R325		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R326, 327		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R328		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R329		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R331		**ERD25FJ271**	Carbon, 1/4W, 270Ω, ± 5%
R332		**ERD25FJ331**	Carbon, 1/4W, 330Ω, ± 5%
R333		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R334		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R335		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R336		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R337		**ERG1ANJ270**	Metal Oxide, 1W, 27Ω, ± 5%
R338		**ERD25FJ122**	Carbon, 1/4W, 1.2kΩ, ± 5%
R340		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R341		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R342		**ERD25TJ563**	Carbon, 1/4W, 56kΩ, ± 5%
R343		**ERD25FJ181**	Carbon, 1/4W, 180Ω, ± 5%
R344		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R345		**ERD25FJ121**	Carbon, 1/4W, 120Ω, ± 5%
R346		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R347, 348		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R349		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R351		**ERG1ANJ151**	Metal Oxide, 1W, 150Ω, ± 5%
R352		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R353, 354		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R355		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R356		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R357		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R358		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R359		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R360		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R361		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R362		**ERD25FJ120**	Carbon, 1/4W, 12Ω, ± 5%
R363		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R364		**ERD25FJ181**	Carbon, 1/4W, 180Ω, ± 5%
R369		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R371, 372		**ERD25FJ271**	Carbon, 1/4W, 270Ω, ± 5%
R373, 374		**ERD25FJ271**	Carbon, 1/4W, 270Ω, ± 5%
R375		**ERD25FJ271**	Carbon, 1/4W, 270Ω, ± 5%
R376, 377		**ERD25TJ124**	Carbon, 1/4W, 120kΩ, ± 5%
R378		**ERD25FJ271**	Carbon, 1/4W, 270Ω, ± 5%
R401	⚠	**ERD50FJ4R7**	Carbon, 1/2W, 4.7kΩ, ± 5%
R501	⚠	**ERG1ANJ103**	Metal Oxide, 1W, 10kΩ, ± 5%
R601, 602		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
CAPACITORS			
C1, 2	⚠	ECKD1H223PF	Ceramic, 50V, 0.022μF, $^{+100}_{-0}$%
C3		**ECEB1VS102**	Electrolytic, 35V, 1000μF
C4		**ECEB1CS102**	Electrolytic, 16V, 1000μF
C5		**ECEA1VS330**	Electrolytic, 25V, 33μF
C6		**ECEA1ES470**	Electrolytic, 25V, 47μF
C7		**ECEA0JS471**	Electrolytic, 6.3V, 470μF
C8	⚠	ECKD1H223PF	Ceramic, 50V, 0.022μF, $^{+100}_{-0}$%
C101		**ECEA1AS101**	Electrolytic, 10V, 100μF
C102		**ECEA1ES101**	Electrolytic, 25V, 100μF
C103		ECQM1H104KZ	Polyester, 50V, 0.1μF, ± 10%
C104		**ECEA1AS470**	Electrolytic, 10V, 47μF
C105		ECQM1H104KZ	Polyester, 50V, 0.1μF, ± 10%
C106		ECQM1H473KZ	Polyester, 50V, 0.047μF, ± 10%
C107		**ECEA1AS470**	Electrolytic, 10V, 47μF
C108		ECQM1H473KZ	Polyester, 50V, 0.047μF, ± 10%
C109		ECQM1H224KZ	Polyester, 50V, 0.22μF, ± 10%
C110		ECQM1H104KZ	Polyester, 50V, 0.1μF, ± 10%
C111		**ECEA25Z4R7**	Electrolytic, 50V, 4.7μF
C112, 113		ECQM1H104KZ	Polyester, 50V, 0.1μF, ± 10%
C114, 115	⚠	ECEA1CN101S	Non-Polar Electrolytic, 16V, 100μF
C116		ECKD1H223PF	Ceramic, 50V, 0.022μF, $^{+100}_{-0}$%
C301		**ECEA1CS330**	Electrolytic, 16V, 33μF
C302		ECCD1H101K	Ceramic, 50V, 100pF, ± 10%
C303, 304		ECKD1H102KB	Ceramic, 50V, 0.001μF, ± 10%
C305		**ECEA16Z33**	Electrolytic, 16V, 33μF
C307		ECQM1H103KZ	Polyester, 50V, 0.01μF, ± 10%
C308		**ECEA50Z1**	Electrolytic, 50V, 1μF
C309		**ECEA1CS330**	Electrolytic, 16V, 33μF
C310		ECQM1H102KZ	Polyester, 50V, 0.001μF, ± 10%
C311, 312		ECKF1E104ZV	Ceramic, 25V, 0.1μF, $^{+80}_{-20}$%
C313		ECKF1E104ZV	Ceramic, 25V, 0.1μF, $^{+80}_{-20}$%
C314		**ECEA1ES101**	Electrolytic, 25V, 100μF
C315		ECKF1E104ZV	Ceramic, 25V, 0.1μF, $^{+80}_{-20}$%
C317, 318		ECKF1E104ZV	Ceramic, 25V, 0.1μF, $^{+80}_{-20}$%
C319		**ECEA0JS471**	Electrolytic, 6.3V, 470μF
C401 [E], [EK], [XL]	⚠	ECNC4A473MD	Paper, 450VAC, 0.047μF, ± 20%
C401	⚠	ECQE2A473MZ	Polyester, 250VAC, 0.047μF, ± 20%
C501 [EK], [EG] [EB], [EF] [EH], [EI]	⚠	ECQE2A103MZ	Polyester, 250VAC, 0.01μF, ± 20%

Areas

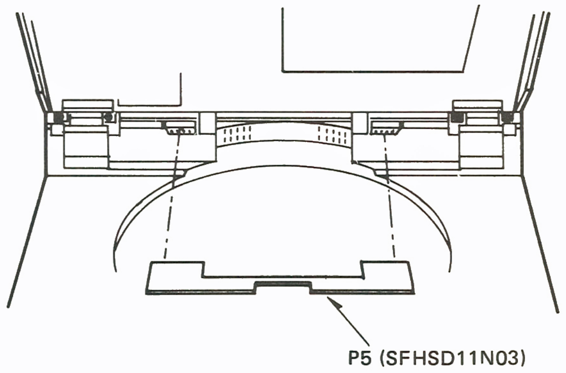
- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

■ PACKING

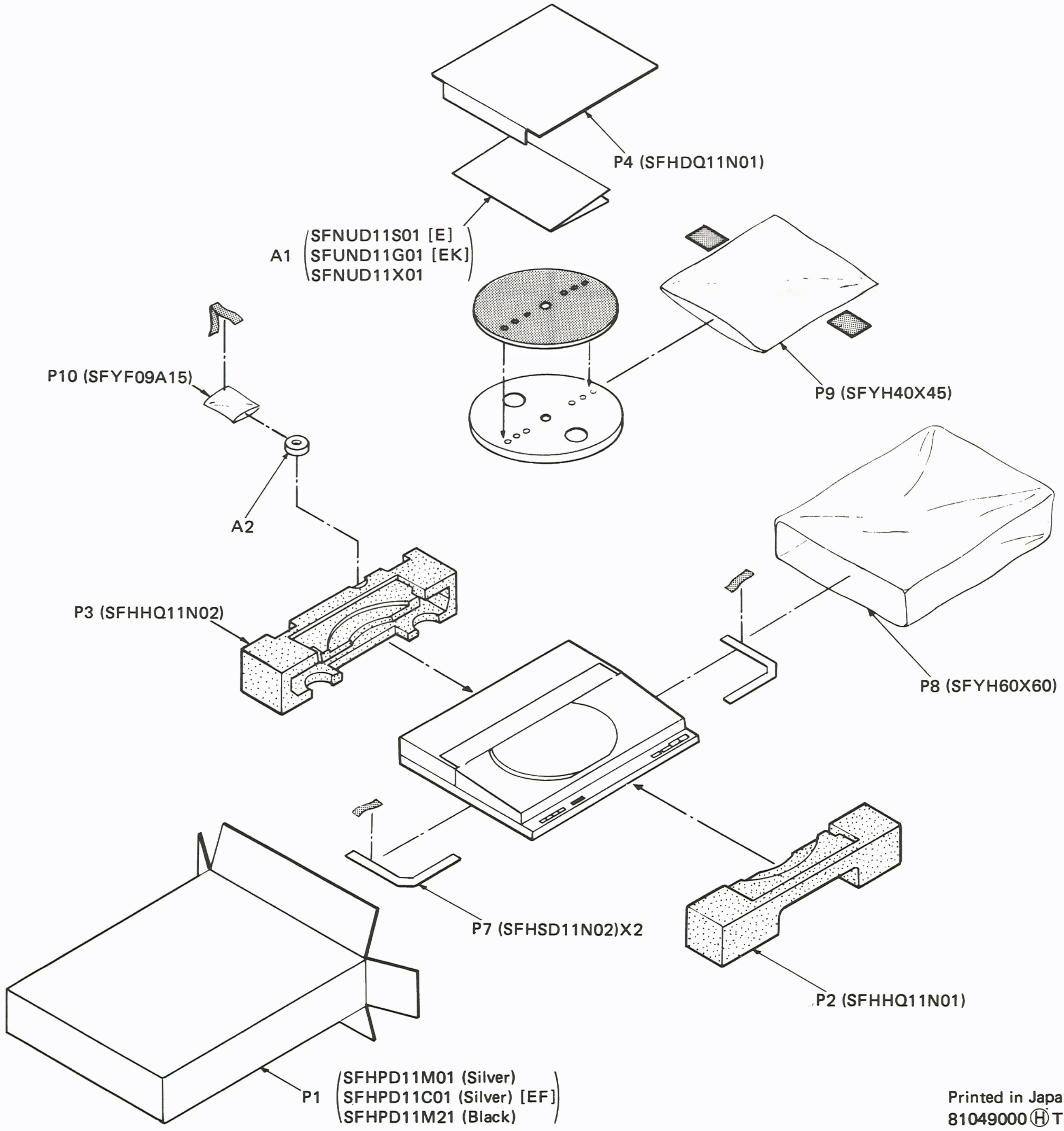
1. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
2. Mount the arm spacer. (Do not lock the arm.)



3. Insert the main body spacer between the main body and upper cabinet.



4. Pack the components according to the following procedure.



Printed in Japan
81049000Ⓗ TK/YW

ORDER NO. SD81051897C4

Service Manual

Direct Drive Automatic Turntable System

SL-DL1

[PA], [PE], [PC]

SL-DL1(K)

[PC]

Areas

- * [PA] is available in far East PX.
- * [PE] is available in European Military.
- * [PC] is available in European Audio Club.

***The colors of this model included silver and black.**
***The black type model is provided with (K) in the Service Manual.**

For additional information, please refer to the service manual for Model No. SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8).

Notes:
- * This service manual included only the change of the **SL-DL1/SL-DL1 (K)** service manual (ORDER NO. SD81041862C8).
- * When servicing model **SL-DL1 [PA, PE, PC]/SL-DL1 (K) [PC]**, this service manual and **SL-DL1/SL-DL1 (K)** (ORDER NO. SD81041862C8) service manual should be used together.

CHANGES

■ REPLACEMENT PARTS LIST

Ref. No.		Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
		SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8)	➡ **SL-DL1/SL-DL1 (K) [PA, PE, PC]**			
MAIN CABINET PARTS						
23		SFNND11S01 SFNND11G02	SFNND11P01 [PA], [PE]	Name Plate	1	○
		SFNND11R01 SFNND11X01	SFNND11P02 [PC]	Name Plate	1	○
24	⚠	SJA88 QFC1205M QFC1208M	**SJA83**	AC Cord	1	
25		SFUM190–11 SFUM190–12	SFUM190–12	Bushing, AC Cord	1	
ACCESSORIES						
A1		SFNUD11S01 SFNUD11G01 SFNUD11X01	SFNUD11P01	Instructions Book, Printed Matter	1	○
A3		SFDK119118	Deletion	2 Pin Plug	0	
A4		Addtion	QJP0603S	Adaptor, Gimens	1	

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shiba-koen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Ref. No.		Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
		SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8) ➡	**SL-DL1/SL-DL1 (K) [PA, PE, PC]**			
PACKING PARTS						
P1	○	SFHPD11M01	SFHPD11M01	Carton Box (Silver)	1	
	○	SFHPD11C01				
	Ⓚ	SFHPD11M21	SFHPD11M21	Carton Box (Black)	1	
P11		SFHSC07–02	Deletion	Spacer (A), Corner	0	
P12		SFHSC07–03	Deletion	Spacer (B), Corner	0	
CAPACITORS						
C401	⚠	ECNC4A473MD	ECQE2A473MZ	Polyester, 0.047μF 250VAC, ± 20%	1	
		ECQE2A473MZ				
C501	⚠	ECQE2A103MZ	Deletion	Polyester, 0.01μF, 250VAC, ± 20%	0	

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